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The Retail Pharmacist Represents a Part of the Drug Industries Most Essential for the Public; His Prosperity and Advancement Are Necessary if Other Divisions of the Drug Trade Are to Prosper

Vol. XVII, No. 1 JANUARY, 1928

JOURNAL

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AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE SEVENTY-SIXTH ANNUAL CONVENTION WILL BE HELD AT POLAND SPRINGS, ME., SEPTEMBER 1928.

The 1928 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Research and of Pharmaceutical Association Secretaries will also be held at Poland Springs, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, of Officers of Pharmaceutical Associations, Local Branches, see pages x, xii, xiv, etc.

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MESSAGES OF FORMER PRESIDENT THEODORE J. BRADLEY AND PRESIDENT CHARLES W. JOHNSON OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The following messages are reprinted from the *Druggists Circular* of January 1928:

"We must endeavor to keep alive the professional spirit of pharmacists"—Theodore J. Bradley, former President of the A. PH. A.:

"DURING more than thirty-five years of intimate contact with pharmacy the writer has observed that pharmacy is frequently facing a crisis, but it always manages to muddle through somehow. This is because the pharmacist performs a service which is essential to the welfare of the public, and this fundamental condition cannot be destroyed.

"Among the present problems of pharmacy, the overcrowded condition of the profession and the overdevelopment of commercialism at the expense of professionalism are among the most serious. A way must be found to limit the number of drug stores to no more than are needed to serve the legitimate pharmaceutical needs of the public and we must endeavor to keep alive the professional spirit of pharmacists. There is no real incompatibility between commercialism and professionalism in pharmacy, and there should be no conflict between good business methods and good pharmaceutical practice, but some pharmacists fail to realize this truth. We cannot expect the public to respect us as professional men if we ignore this aspect of our work ourselves.

"The writer is optimistic enough to believe that these problems, and others, will be solved somehow, sometime, and he wishes that pharmacists everywhere may enjoy a happy and prosperous year in 1928."

"The Association aims to foster a high professional morale"—Charles W. Johnson, President of the A. PH. A.:

"THE AMERICAN PHARMACEUTICAL ASSOCIATION for more than seventy-five years has endeavored to work for the common interest of every division of pharmacy. In doing this it has also kept in mind that the public should be served with pure drugs of definite standards in quality, and that expert professional service on the part of the pharmacist is of prime necessity.

"The ASSOCIATION has, therefore, urged that the pharmacist should be properly trained by education and experience before assuming his full responsibilities to the public. It aims to foster a high professional morale, and believes that the retail pharmacist will prosper accordingly as he is regarded as an expert in his profession by the people of his community. The ASSOCIATION believes in honest advertising, fair trade legislation and in the strict observance of laws, both State and national, affecting pharmacy and public welfare.

"Members of the AMERICAN PHARMACEUTICAL ASSOCIATION believe that it is the one place where ideas representing all phases of pharmacy can be impartially discussed and conclusions reached that will be for the general good of all branches of the profession.

"It is hoped that 1928 will bring increased prosperity to the retail pharmacists of America and that this in turn will benefit all branches of pharmacy. The retail pharmacist represents the division of pharmacy that the public most clearly recognizes. His prosperity and advancement are necessary if other divisions are to prosper.

"Those persons who speak against retail pharmacy of to-day should be reminded that never in the history of the world has the public been served with as high a standard of pharmaceuticals as now. Science is advancing and the standards of all kinds of materials affecting public health will continue to advance. Education in pharmacy, by means of the many avenues for dissemination of knowledge, is more thorough, and therefore the public is served more expertly than ever before. It is true that conditions in pharmacy are far from perfect, but the writer believes that every branch of pharmacy has cause to rejoice at the progress being made and at the evident prosperity of all persons interested in the profession. It is believed that still greater scientific, professional and economic progress is in store for pharmacy in the future."

EDWARD SPEASE.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XVII JANUARY, 1928 No. 1

EDWARD SPEASE.

Edward Spease, President of the American Association of Colleges of Pharmacy, began work as teacher in his *Alma Mater*, the Ohio State University, as student assistant in pharmacy in 1905 and continued in that capacity until 1908 when he became instructor, serving until 1914. In 1914, he was elected Assistant Professor and the next year the responsibilities of Secretary of the College of Pharmacy were added to his duties. President Spease was elected to the Chair of Pharmacy in 1916, and dean of the School of Pharmacy, Western Reserve University, and he has continued to serve in these capacities. Professor Spease earned the Ph.C. degree in Ohio State University in 1905, and in 1907 the B.Sc. degree; he was registered as pharmacist, in Ohio, in 1905.

His activities in Association work are indicated by his affiliations—he is a member of Northern Ohio Druggists' Association, of Ohio State Pharmaceutical Association, of the American Chemical Society, American Public Health Association, Cleveland Academy of Medicine, and of AMERICAN PHARMACEUTICAL ASSOCIATION since 1912; for two years he has been National President of Phi Delta Chi. He is author of the law setting Ohio standards for pharmaceutical education.

President Spease's birthday table, on March 31st, will be resplendent with 45 candles. Mrs. Spease, who was Miss Alice Kelly, of Pittsburgh, usually, if not invariably, accompanies her husband to the conventions.

Basing judgment on experience and energy of the present incumbent of the presidential office of the American Association of Colleges of Pharmacy and its record of achievement, the organization can look forward to a year of continued service and progress.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

THE YEAR WITH US.

THE first week of every January seems to be a time when most individuals look forward; some hopefully, others not. Fortunately, most of the thoughts of the week are expressive of hope and, certainly, it is a better attitude than one of doubt and misgiving. We must have faith, hope and courage in order to accomplish; faith in the mission of pharmacy, hope in its progress and courage to share in solving its problems.

Dean Frederick J. Wulling was asked to broadcast a series of six radio talks over University of Minnesota Station W. L. B. After transmitting two of these messages of pharmaceutical information he was asked if he would double the number of talks and he consented. He is giving the public a better understanding of pharmacy, of its importance in public health service, as a part of the professional and business life of the State. In rendering this service to pharmacy the public is impressed with the greater value of its University. In speaking of the latter service, in the ninth of the series, the Dean acquainted the "listeners-in" with the direct and indirect service being rendered the public by the College of Pharmacy of the University of Minnesota—by contributing to educational advance, pharmaceutical progress, coöperation with other pharmaceutical bodies, services to the U. S. Government, the value of the medicinal plant garden, research, revision of the standards, by supplying medicinal preparations to other University divisions, analyses and identification of items sent to the College, professional advice to pharmacists, advice upon drug culture, service to the Minnesota State Pharmaceutical Association, etc.

He also conveyed the message of the AMERICAN PHARMACEUTICAL ASSOCIATION to his hearers, of its service, made them acquainted with its code of ethics, its promotions. The speaker connected up the Headquarters project in his talk of Tuesday evening, December 6th, from which the following is quoted:

"Another significant evidence of the trend of pharmacy is found in the decision of the AMERICAN PHARMACEUTICAL ASSOCIATION to undertake a campaign for the raising of one million dollars for the erection of a pharmaceutical Headquarters building. The campaign has already made good headway and more than $600,000 has been subscribed. Washington, D. C., will be the location for the new building and soon now the drive will become more intensive to complete the full million dollars needed. Subscriptions are entirely voluntary. Every person, firm and corporation engaged in any of the several divisions of pharmacy has been or will be approached some time during the drive. All pharmacists who are listening in, please take notice of this fact. The subscriptions are not expected to be greater than pharmacists feel their respective circumstances permit but the contributions must be fairly generous to meet the total needed for the project. It is felt that subscribers will not be burdened under the provisions of the plan for the payment of subscriptions since these may be remitted in ten equal installments during a period of five years so that a pharmacist subscribing $100.00 would never need to write a check for more than $10.00 at any one time. Of course, subscriptions are not confined to those interested in pharmacy. Information is at hand to the effect that several ten thousand and one or two twenty-five thousand dollar subscriptions have already been made. Several one thousand and some hundred dollar subscriptions have already been made by retail pharmacists of the Northwest."

There are others who have done like work and the aim of the comment is not to speak of only one who has brought the message of pharmacy over the radio to the public, for quite a number have done so, especially during Pharmacy Week, but

it is for the purpose of encouraging others and expressing appreciation to all who are making the public better acquainted with the mission of Pharmacy.—E. G. E.

THE AMERICAN PHARMACEUTICAL ASSOCIATION AND THE HEADQUARTERS BUILDING.

THE following has a general interest for those who would like to be better informed relative to the AMERICAN PHARMACEUTICAL ASSOCIATION, and the Headquarters soon to be a realization. This being the first issue of the JOURNAL in the New Year, suggests the printing of an informative message, prepared by Secretary E. F. Kelly.

"The Headquarters project has for its objects:

First.—To properly equip the AMERICAN PHARMACEUTICAL ASSOCIATION to carry on the great work which it has been doing since 1852.

Second.—To consolidate so far as possible the efforts and influence of pharmacists—retailers, wholesalers, manufacturers, research workers, writers and teachers—to improve pharmaceutical conditions and to educate the public, through coöperative publicity, to a fuller appreciation of the value of pharmacy as a public health agency.

"From its organization the AMERICAN PHARMACEUTICAL ASSOCIATION has taught that the future of pharmacy rested upon its ability to furnish the public with an adequate pharmaceutical service and that this is the sole basis on which pharmacy has a claim to a licensed or protected position in society. Consequently, it has given major consideration in its work to pharmaceutical education: to the enactment of adequate legislation to regulate the licensing of pharmacists and the practice of pharmacy; to the development of adequate standards for the identity, purity and strength of drugs and medicines; to the control of drugs and medicines which may be habit forming, poisonous or otherwise dangerous; to fostering pharmaceutical research with the purpose of improving the quality of drugs and medicines and of discovering new ones; and to encouraging, collecting and preserving and recording pharmaceutical literature and history.

"While the ASSOCIATION has given a good part of its effort to fostering the professional phase of pharmacy it has always realized that the distribution and sale of drugs and medicines and of the many other items which the public looks to the druggist to supply, is a very important part of pharmacy and that the commercial ability of the pharmacist is second in importance only to his pharmaceutical training. It has, therefore, encouraged adequate training of pharmacists in commerce and economics, and organized many years ago, as one of its five professional sections, the Section on Commercial Interests. This has become one of the best attended and most important of the five sections of the ASSOCIATION and deals, in a fundamental way, with the economic and commercial phases of pharmacy. The ASSOCIATION has always considered commerce as an important profession and as one of the group of sciences and professions on which the practice of pharmacy is based.

"The search for drugs, sources of chemicals, spices, perfumes, etc., developed the early commerce of the world and still is a most important stimulus, especially as most of the material is represented in nearly all of the industries. Thus, as general examples, the search for balsams gave us the utilitarian product—rubber. Reversely, the search for potash for the industries, of more or less importance in pharmacy and medicine, has shown us that one of the "Acres of diamonds" in that connection is within our own country.

"It is apparently being understood by all classes of pharmacists that the development and the commercial success of pharmacy are dependent upon keeping alive the "spirit of pharmacy" and in bringing about conditions which will enable the pharmacist, whether retailer, wholesaler or manufacturer, to give the public the

pharmaceutical service that it requires and at the same time make an adequate living and competence for himself, in keeping with that of other citizens.

"This object requires coöperation to a greater extent between the different classes of pharmacists, the realization that the success of any class is dependent upon the success of all others, and that the influence of pharmacy as a whole must be combined as far as this is possible and practicable. The Headquarters Building will provide, for the first time in the history of American Pharmacy, the opportunity and equipment for such coöperative efforts in education, in legislation, in research and in publicity under the auspices of the ASSOCIATION in which all who are interested in pharmacy are eligible to membership and which has devoted itself unselfishly to the good of all."

Progress is being made with the Headquarters project, the amount of cash in hand is well toward $300,000 and the subscriptions amount to considerably more than double that sum; the site for the Headquarters is having consideration.

A NEW DEPARTMENT IN THE JOURNAL.

WITH this issue of the JOURNAL a Department is inaugurated in which questions relating to laws which apply to the pharmacist will be discussed. Howard Kirk, well- and favorably-known member of the Philadelphia bar, has consented to conduct this division of the JOURNAL. In the first installment, he is searching for the point of contact and it is hoped that a valuable department for pharmacists will develop.

The AMERICAN PHARMACEUTICAL ASSOCIATION consistently aids in the promotion of measures that serve the public and pharmacy—this is conclusively shown by the provision of standards and legislation which, as is well known to all pharmacists, resulted through its coöperative efforts and speaks for its continuance in such efforts. The ASSOCIATION likewise, at all times, supports all laws, encourages their enforcement by coöperative efforts. Doubtless, there are regulations and laws which require correction and to that end the organization of secretaries of pharmaceutical organizations, formed during the convention in St. Louis of the AMERICAN PHARMACEUTICAL ASSOCIATION, may be most helpful.

It would seem a unity of action in legislative matters that pertain to the States, would promote a better understanding of needful and necessary legislation and suggest means for correcting laws which serve no very useful purpose in their present form. Prevailing conditions give the legislators many suggestions for new laws and regulations and some of them might be persuaded to permit free discussion of their proposals before enactment, so that best results might follow.

Practices that have at first little significance may grow into sources of danger and make necessary proper regulations for correction and control. In the legislative measures in force, proposed and possible, there are many points of contact of the druggist and pharmacist with other activities that cause them to share in a larger number of regulative measures, laws, licenses, taxes, etc., than other members of related trades and professions, hence the value of coöperative efforts are nowhere of greater value than in the drug industries. Quoting from Dr. J. H. Beal's address before West Virginia Pharmaceutical Association:

> "The formulation of a proper statute involves something more than the simple hiring of an attorney to convert the suggestions of the legislative committee of a State association into legal phraseology. It needs the lawyer trained in the principles of statutory interpretation and constitutional law in order that the new statute may have the necessary legal validity; it needs the help of the political economist posted in the reactions of legislation in order that the statute may not fail through infringement of economic principles; and finally it needs the technical knowledge and practical experience of the man in business, in order that it may not be burdened with provisions incapable of practical application."

It is through coöperation that the AMERICAN PHARMACEUTICAL ASSOCIATION has, perhaps, served most and best, and it will continue to serve.—E. G. E.

SCIENTIFIC SECTION

THE AIMS AND METHODS OF MODERN PHARMACOLOGY.*

BY DAVID I. MACHT.

I am glad to have the opportunity to speak on pharmacology to-night as it is a subject which is coming more and more to the fore and in this country is also one very much misunderstood, not only by the chemists but even by some medical men and by most pharmacists. We are dealing here simultaneously with one of the oldest of sciences and also one of the newest, because pharmacology on the one hand was confused by the ancients with pharmacy which, of course, is as old as medicine is itself, and on the other hand, because modern pharmacology in its most highly developed state is especially concerned with the relation existing between the physical and chemical properties of various substances and their action on functions of living matter, in the most intensive and extensive sense of the word. To give a definition of pharmacology is not an easy task as is the case with all definitions; indeed many well-known textbooks on the subject such as Sollmann's in English, Poullson's in Scandinavian and Meyer and Gottlieb's in German, avoid doing so altogether. The two most prominent and authoritative books on the subject in English, however, define it quite satisfactorily in the following way. Cushny states that "Pharmacology is the study of the changes induced in living organisms by the administration in a state of minute division of such unorganized substances as do not act merely as foods." A much more comprehensive and I believe more accurate definition is that given by Prof. W. Dixon, of Cambridge, who speaks of pharmacology in its broadest sense as that "science which deals with the alteration of function in living matter brought about by changes in its environment." This broad definition of pharmacology which appeals to me very much can be put more clearly in the following way. Pharmacology in its broadest sense is that great department of knowledge on the border line between biology and chemistry which deals with the relations of the two. If by the term biology we understand all the sciences dealing with living organisms whether they be of plant or animal origin, we can conveniently subdivide the consideration of its subject matter under four headings. The first is *Morphology* which deals with the anatomy, histology and finer structure of all living organisms. The second is *Physiology* which concerns itself with the normal functions of living matter whether of plant or animal origin. The third is *Pathology* which treats of the changes anatomical or physiological produced in living matter by disease. The fourth is the very extensive branch of *Biology dealing with the alterations* in living organisms or tissues *produced by all matter*, in the chemical sense of the word. This is the domain of pharmacology. At the present stage of its development in view of the fact that physical and chemical phenomena are no longer to be separated, pharmacology may be stated to be that science which deals with the effects of physico-chemical forces on the physiological functions of living matter. This broad definition of pharmacology expresses, I am quite sure, the conception of the subject held by

* Read before the Maryland Section of the American Chemical Society, October 26, 1927, at the Chemical Building, Johns Hopkins University, Baltimore, Maryland.

most of the prominent pharmacologists in America and abroad. In subdividing the subject of biology as I have done, it is evident at once that there is a certain amount of over-lapping between the various subdivisions. This is especially true of the relation between pharmacology and pathology. A great many, if not most, diseases or pathological conditions are produced in their final analysis by chemical, *i. e.*, pharmacological agents and therefore it is not surprising that many a problem of pathology is undertaken and often solved by the trained pharmacologist. No better evidence of this could be furnished than the name of the oldest and leading pharmacological journal in the world, namely, *Shmiedberg's Archiv für Experimentelle Pathologie und Pharmakologie.* A number of synonyms and pseudonyms for pharmacology have crept into our language in the long course of its development. The older physicians often spoke of pharmacology as part of the all-embracing subject of Materia Medica. Materia Medica by these older authorities was used to include all sciences dealing with medicaments. At the present time this phrase Materia Medica is generally employed in a much more restricted sense, and really denotes a catalog-like description of the pharmaceutical and chemical properties of official drugs and other medicaments. In order to lay stress on the physiological aspects of pharmacology dealing as it does with the effects of drugs or chemicals on physiological functions the term *pharamacodynamics* has been coined. This, however, is not synonymous with pharmacology because the latter includes not only pharmacodynamics but also a study of the chemical, botanical, pharmacognostic and even pharmaceutical properties of various substances or chemicals employed in therapeutics or the treatment of disease. What are the purposes and aims and methods of approach characteristic of this science?

Before proceeding further it is well to rectify some misconceptions which have crept in. The peculiar border line position of pharmacology between physiology and physiological chemistry in medical schools has led to a certain paternalistic attitude on the part of physiologists on the one hand and of chemists on the other towards this comparatively new department of medical science. It is not so long ago that pharmacology was classed as a subdivision of physiology and the action of a few drugs on animals was demonstrated by instructors in physiology. Even now while most of our great universities and all of the European ones have well established independent chairs for pharmacology there are some schools in these United States in which the subjects of physiology and pharmacology are still being lumped into one and the same department. Even though the head of such a department were qualified to teach both, the ramifications of pharmacology have grown to such an extent that it is physicially impossible for any physiologist to do justice to both at the same time—the combination figuratively speaking makes too great a mouthful for even the man of gigantic proportions to swallow.

Even more curious in this day of medical specialization is it to find pharmacology as a subordinate to the department of biological chemistry; yet such a curious phenomenon is actually existing in certain parts of the United States. Of course, phenomena like these are but anarchronisms, and belong to the age when anatomy was taught by the practicing surgeon and the teaching of Materia Medica and thereapeutics was the prerogative of the practicing physician.

A misconception of pharmacology of quite a different sort and of a perhaps more

pardonable character is that entertained by certain organic and other chemists, who are beginning to realize that pharmacology and toxicology play an important rôle in connection with the manufacture of synthetic chemicals which have come into use in medicine or which at least have a certain therapeutic value from the commercial point of view. Some of these gentlemen seem to entertain an idea that the pharmacologist is a sort of a simple slot-machine or a music-box convenient to have for testing drugs. Given a new chemical compound all that is necessary to gage its market value is to push it into the slot and presto a card flies out predicting its medicinal complexion and its future value in dollars and cents. Unfortunately, to carry the simile a little further, if the pharmacologist be likened to a music-box, the answer to the chemical inquiry will not be so simple and if the coin is of real value the tune that will be played by the musician will probably not be a very simple one but on the contrary a complicated symphony requiring time and study for its full appreciation.

Still another distorted conception of the scope of pharmacology is that entertained especially in America, by some manufacturing pharmacists and druggists who have also come to realize that pharmacology is something deserving of a place in their establishments. Among such the conception of a pharmacologist is something in the nature of a specialist in biological assay or testing of drugs. All that they expect of such a specialist is to poke a few syringefuls of a medicament into a rat or guinea-pig and see how much it takes to kill; or possibly to test the action of a medicament on the contractions of a piece of uterus; and if the tester can perform a blood-pressure experiment with a highly expensive Kymographion to make a tracing and show that ergot raises the pressure, he is regarded as a wizard. This conception of pharmacology is about on a par with a conception of chemistry which limits its scope to a determination of nitrogen and carbon of a new compound without any attempt at the elucidation of its more complicated chemical structure. Such a technical automat is very useful as far as it goes and the live pharmacologist employs such automats as technicians in order to carry out the very necessary and important assays which may be deemed necessary in the course of his work. But the mere testing of a drug by such simple methods without a broader and more profound interpretation of the results obtained and without a further and more extensive pharmacodynamic analysis of its action is but a small chip in the very complicated mosaic composing the puzzle or problem which confronts the true pharmacologist in the broader sense of the word. The problems which confront the research pharmacologist are as extensive and varied as the whole field of medicine and biology on the one hand and chemistry on the other. This is at least the conception of that science entertained by its leading exponents in Europe and America.

In order to convey an adequate idea of the task confronting the pharmacologist it may be well to take a concrete example. Let us inquire broadly into the pharmacology of digitalis which is still the most important heart drug employed in medicine. Fox-glove or *Digitalis purpurea* has long been known in medicine as a remedy for dropsy. As is the case with a large number of our most important drugs the use of digitalis leaves for medicinal purposes originated in folk medicine and was practiced by the laity long before it was taken up by physicians. It was not until the end of the 18th century that this old wives' remedy

attracted the attention of a Shropshire physician, William Withering (1741–99), who was the first to examine it critically in a real scientific way. Withering's studies were almost entirely of a clinical nature, but his scientific insight and acumen were of such a lofty quality that his empirical deductions concerning the therapeutic action and poisonous effects of digitalis revealed more critical well-balanced judgment than that exhibited by many a modern physician or pharmacologist. His "Account of the Fox-glove" (1785) remains one of the most fascinating pharmacological and medical classics on record. It was long after Withering's work was published that the pharmacology of digitalis and allied drugs in the modern sense of the word began to be studied, and we may state at once for your information and delectation that our knowledge of the pharmacology of digitalis at present is perhaps more incomplete than it was fifty years ago. This, of course, implies that heart drugs are beginning to receive serious attention on the part of scientists, and that they are just beginning to find out how little they know.

In order to investigate the pharmacology of a cardiac drug belonging to the digitalis group, and there are quite a number of such drugs both of plant and animal origin, we must turn our inquiries in several distinct directions. Inasmuch as pharmacology rests upon the fundamental bases of chemistry on the one hand and physiology on the other, attention is directed first to the chemistry of digitalis. What is the active principle or principles in the digitalis plant responsible for the very interesting and sought-for medicinal effects produced by the crude drug? Here we touch upon one of the cardinal objectives of the pharmacologist, *the Search for Active Principles.*

The desirability of isolating a definite chemical body from a crude drug is obvious. Such a pure body can be studied accurately in regard to its pharmacodynamic properties and the results thus obtained will not be distorted by the combined effects of other bodies present or of impurities. Standards of assay and more accurate dosage will be thus obtained and furthermore it is only when a definite chemical principle is isolated that the research chemist may hope at least to solve its structure, and point the way to new synthetics. The chemistry of digitalis has been the subject of study on the part of some of the most eminent men in pharmaceutical chemistry and pharmacology. Many active principles mostly of the glucoside type have been isolated from the digitalis plant but very few of these have as yet been completely studied and but little is known as to their chemical structure. While all such studies are largely chemical in nature the search for active and pure principles of drugs is the legitimate prerogative of the pharmacologist, for hand in hand with all such work must go the study of their action on living things. Quantitative analysis of the various ingredients of the digitalis leaves and seeds must also be made. Further studies on his part are directed towards examination of other cardiac drugs which belong to the digitalis group pharmacologically, and an inquiry as to the relation of their active principles if such can be obtained towards those of digitalis. This leads to the discussion of the second cardinal objective in pharmacology—*The Study of Pharmacodynamics.*

Having obtained a reliable preparation of digitalis the pharmacologist proceeds to study the action of such preparations (or if possible of active principles) on living tissues. Here another word of caution may be stressed. Everyone in this assembly has heard of digitalis and everyone of those here present is quite

familiar with the fact that the principal if not the only use of digitalis preparations is for the treatment of cardiac conditions or disturbances of circulation. In what does the pharmacodynamic study of digitalis consist? Obviously the uninitiated would say, in the study of its action on the heart and circulation. The drug tester or biological assayer would take a new heart drug and examine its effect on the frog's heart by injecting some of the substance into a frog's lymph sac; or he would perhaps perform an imposing blood pressure experiment and see what the drug does to the blood pressure. If he is very ambitious he might further determine the killing-dose of the drug not only for a frog but also for a cat. On the basis of data thus obtained he would render his verdict. Such a superficial study of a heart drug is not the kind that the real pharmacologist would undertake in the case of a drug which is worth while. He knows full well that every drug while showing some striking physiological effect on some particular organ or tissue will also influence either directly or indirectly, to some extent, all other functions of a living body. It is a platitude to say that the body is one. Every cell in the body is more or less connected by physical or chemical or biologic bonds with every other cell. The complete study of the heart drug will, therefore, not only include study of its effects on the circulation but also on the respiration, on the kidneys, which by the way are very intimately connected physiologically speaking with the heart, on the nervous system, on the blood, on the gastro-intestinal tract and indeed on every other organ of the body. Let us, however, confine ourselves for a moment to the effects of a drug on the circulation. A so-called cardiac or heart drug must be studied even in that special field of physiology dealing with the circulation from various angles and the results obtained must be compared and weighed before passing intelligent opinion on its value. In studying the circulation one must inquire into the effects of a drug firstly on the heart, secondly on the blood vessels, thirdly on the nervous system. Let me briefly mention what such a study means; and let us begin with the nervous system. Circulation is profoundly influenced by variations in the nervous apparatus of the body, both the peripheral and central nervous systems playing a rôle. A drug like digitalis not only exerts an influence on the heart muscle itself but also acts upon the heart in marked degree through various nervous centers. The slowing of the heart produced by digitalis is a result of its action on the so-called cardio-inhibitory or vagus center in the medulla. The inhibitory effect is produced by impulses traveling from the center down the vagus nerve to the nerve terminals of the vagus in the heart substance itself, thus producing a slowing of the heart rate. Digitalis and other heart drugs may also influence the circulation profoundly though indirectly through their effect on the cerebrum. The vasomotor center in the medulla may also be affected by such drugs, and last but not the least the circulation can be changed to a large extent through changes in the autonomic nervous system.

The effect of heart drugs on the circulation will differ again to a great extent with the state of the blood vessels. Such drugs must therefore be observed as to their action on the arteries, capillaries and veins. Here the pharmacologist stumbles upon a most fascinating phenomenon, namely: he learns that various vessels are affected by the self-same drug, in very different ways. The same pharmacological agent may produce a constriction of the splanchnic vessels and at the same time a dilation of the vessels of the skin so that a complete study of the

effects of any drug on blood vessels must include separate studies of individual arteries and veins.

If we now turn to the effect of digitalis on the heart, the data now obtained from simple blood pressure experiments are not at all complete. In the first place the blood pressure curve gives only an indirect and incomplete indication as to the action of a drug upon the heart itself. In studying the effect of a drug on the heart in a true and thoroughgoing pharmacological way the investigator must inquire into the action of such a drug on: (1) the dromotropic function of the heart, that is its conductivity, (2) the bathmotropic properties of the heart muscle or its excitability, (3) the chronotropic property, that is the regulation of its rhythmicity, (4) the inotropic properties or contractility, (5) the tonus of the muscle wall and (6) the circulation of the heart muscle itself, or coronary arteries. He may extend his studies further and study the effect on various heart ganglia; and with all such data in his hands he will begin to realize that he has advanced but very little towards the complete understanding of the action of the drug on the heart. In the first place these studies will have to be carried out not only on the frog's heart but upon the hearts of various higher animals. It has been found that various animals react very differently to the effects of the same drug. The study of the drug on the heart will have to be carried on not only in situ in the intact animal but also on the isolated heart, and perhaps on isolated heart strips in order to study the reaction of muscles for various parts of the organ. With the advances of modern physiology the study of the heart effect will furthermore not be complete without some work with the electrocardiograph. Yet with all data thus obtained the practical pharmacologist is far from being in a position to apply them to clinical practice, because of a very important point too often lost sight of, both by the pharmacologist and the practicing physician. I am referring to the circumstance that the vast majority of the experiments performed by the pharmacologist in his laboratory are made on normal animals and it is a well-known fact that pathological organisms and tissues will often react to certain drugs very differently from the way they react in normal state. We have learned to appreciate the fact that many drugs in ordinary doses may exert no appreciable pharmacological action on normal organisms and yet the same drugs even in smaller doses will produce profound changes in the diseased animal or pathological organ. This is a trap into which many a conscientious physician has fallen. The careful medical investigator must bear in mind the part played by "*vis medicatrix naturae*" in all pharmacological and therapeutic experiments and clinical observations. It may be stated as a general law that there is a tendency on the part of nature to restore abnormal or pathological states of living organisms to normalcy, so that the effects of pharmacological agents which tend to exert their action in the same direction are more evident or more pronounced when applied in pathological states than under normal conditions. To illustrate, we cannot reduce much the temperature of a higher animal by administering even large quantities of so-called antipyretic drugs, under ordinary circumstances; yet when the temperature is above normal, that is when the animal or the patient has fever, even a small dose of such an antipyretic will promptly tend to lower the temperature. Again, there are certain antispasmodic drugs such as the alkaloid papaverin and certain Benzyl Esters which exhibit the remarkable property of lowering the tonus and inhibiting

the peristalsis of various smooth muscle organs. Such drugs exhibit this peculiar antispasmodic property on smooth muscle in normal animals to a considerable extent, but where such smooth muscle organs are in a state of abnormal tonicity or peristaltic movement the sedative effect is much more marked. This is especially true of angiospasm, or spasm of the blood vessels. Some years ago I found that the simple and innocuous esters, benzyl benzoate and benzyl acetate, produced a distinct fall in the blood pressure of rabbits, dogs and also human beings. Such a fall in blood pressure is, however, not at all as marked when the observations are taken on normal subjects than when they are made on cases of abnormally high blood pressure due to spastic condition of the arteries. These observations have recently been confirmed in a very ingenious way by two Rumanian investigators who studied the effects of benzyl benzoate and benzyl acetate on man by Plethysmographic methods under both normal and pathological conditions. While the fall in blood pressure after intramuscular injections of solutions of these drugs was not very great in normal health, these authors have noted a marked and long-lasting fall in blood pressure in cases of true hypertension due to a distinct vasodilatation produced by the drug. (1). Another example is the action of opiates and other analgesic or pain-relieving drugs. Their specific action can certainly not be appropriately studied on normal animals, because they obviously do not suffer from pain. So with digitalis and other heart drugs. One cannot appreciate fully either the pharmacological or therapeutic significance of a heart drug by studying its effects on the healthy and strong heart. It is self-evident that an ordinary heart muscle cannot contract much more powerfully than it is intended by nature to contract. When, however, the subject is suffering from myocardial insufficiency or weakening of the heart muscle, administration of Digitalis will draw the flabby heart together and strengthen its contractions in a truly wonderful manner.

These pharmacological studies of Digitalis which I have just briefly outlined do not by any means exhaust the topics involved in an adequate study of that drug. I have not touched upon the influence of Digitalis on the respiration, a subject which must always be considered in connection with the circulation. Nor have I dwelt upon the gastro-intestinal effects which are of particular interest in connection with the therapeutic uses of this drug. Again it is absolutely imperative for the complete knowledge of the action of any drug to obtain definite information concerning its absorption and excretion and fate in the body. This in case of digitalis is of especial importance on account of the remarkable phenomenon of cumulation which it exhibits and which virtually involves a biochemical study of the combination myocardium or heart muscle plus digitalis and the interaction of digitalis glucosides and blood and is inseparable from the subject of *Toxicology*, which is the next cardinal line of inquiry to be pursued by the pharmacologist.

Toxicology is really only one phase of pharmacology because we have come to appreciate more and more that every drug is also a poison as the etymology of the words for drug and poison in different languages clearly shows. The old English "to drug" and the Greek ΦΑΡΜΑΚΟΝ denoted both medicine and poison. It may be stated as a general principle with hardly an exception that every drug that is *worth while* is also a poison, and in order to employ it intelligently for the production of a desirable effect, the physician must be familiar with its toxi-

cology as well as with its pharmacodynamic properties. Toxicological studies of course, just as pharmacological ones, involve both chemical and physiological experimentation, into a discussion of which we cannot here enter. The pharmacologist must learn not only to recognize the clinical signs and symptoms of a poisonous nature, but also to detect by chemical examination the presence of the poison in various tissues, secretions and excretions. Such a discriminating difference between a desirable medicinal effect and a deleterious one, which is the basic principle of all therapeutics and is expressed by the ancient maxim "Nolle Nocere," demands an exhaustive study of the various *Conditions Modifying Drug Action* which is a fourth cardinal topic of inquiry confronting a pharmacologist.

The conditions or factors influencing the action of drugs are very numerous but for pharmacological discussion they may be divided into three classes: (1) those depending upon the drug itself, (2) those depending upon the animal or patient to whom the drug is administered and (3) certain external factors indirectly connected with either the drug or the experimental subject. Factors playing a rôle in determining the poisonous or therapeutic effects of a pharmacological agent which depend on the drug itself are very numerous. In the first place *the dose* of the drug obviously plays an important rôle. The same substance which, given in small quantities, may produce a very desirable therapeutic effect will, when given in larger doses, produce death, as for example is the case with hydrocyanic acid. This acid which is known as one of the most virulent and rapidly acting poisons will not produce, under certain conditions, any poisonous effects at all. When it is administered in very minute quantities to higher animals the drug or poison is taken care of by the living organism which combines it with certain amounts of available sulphur, forming harmless compounds. As soon, however, as a given limit is reached the poison paralyzes the respiratory center and produces death through interference with the normal functions of the red blood cells. The *penetrating properties* of various drugs, that is their property of penetrating through the cell membranes, is of extremely great importance in connection with their pharmacological action. Some drugs may be taken by mouth with perfect impunity and yet the same substances when injected into an animal produce severe poisoning or even death. Thus for instance potassium salts may be and are freely taken by mouth by normal as well as diseased individuals and no harmful results follow such a procedure because, when the kidneys are normal, these salts are rapidly absorbed and just as rapidly excreted in the urine. When, however, a potassium salt is administered intravenously, the characteristic effect of the potassium ion on muscle, and particularly on heart muscle, manifests itself and produces a slowing and sometimes arrest of the heart. Magnesium sulphate taken by the stomach acts as a so-called saline purgative, the purgation being produced through certain peculiar properties of the magnesium ion. Magnesium ions are absorbed through the gastro-intestinal mucosa only to a very slight extent. When, however, magnesium sulphate is injected into an animal either through a vein or even subcutaneously, the characteristic depressant effects of the magnesium ion for the central nervous system are produced, causing a paralysis of the respiratory center. (2). The arrow poison curare introduced into the stomach of a rabbit produces absolutely no deleterious effect. When, however, a minute quantity of this drug is injected into its skin or muscles it is rapidly absorbed, producing

a paralysis of the motor nerve endings and leading to the death of the animal. More interesting still it has been recently observed by Mautner and Koref that if the rabbit be given an injection of insulin previous to the administration of curare by stomach, another change in permeability of tissues is brought about and the same poison is now absorbed through the gastro-intestinal channel producing characteristic signs of curare poisoning. (3). The *physical properties* of the drugs administered to animals and human beings play also a rôle in respect to their pharmacological action. Thus the solubility of various medicaments such as arsenic, phosphates, etc., will make a difference in regard to their therapeutic and toxic effects. Bile for instance is necessary for the proper action of certain anthracene purgatives. The reaction of the various body secretions and juices will, of course, affect the chemical and pharmacological properties of various medicaments. The concentration of the drug will also play an important rôle. The presence of colloids in the stomach will affect the action of various drugs. Many a victim has been saved from the fatal effects of a poison by having taken it on a full stomach. Such a substance as common salt when taken in isotonic solutions will produce no harm yet when a concentrated solution of brine is introduced into the stomach it may produce shock and even death. The Chinese are said to have used this method of dispatching their criminals.

The action of a drug will vary a great deal depending upon the animal or patient to whom it is administered. Different kinds of animals often react very differently to the same pharmacological agents. A rabbit requires some fifty times as much morphine to kill as a man does. (4). The salamander will not be paralyzed by thirty times as much curare as a frog. Digitalis bodies are not very toxic for the toad's heart and yet are extremely toxic for the frog. Not only do different kinds of animals vary in their susceptibility to various drugs and poisons but it has been found that even two species of the same genus will react quite differently. Thus caffeine injected into *rana esculenta* will produce its chief effect upon the nervous system, whereas caffeine injected into *rana temporaria* will exert its action upon the skeletal muscles. The age of animals plays a very important rôle in connection with the action of drugs. Sex under certain conditions will also produce a difference in both intact animals and also in isolated surviving organs. Again epinephrin or adrenalin exerts an entirely different effect on the isolated pregnant uterus from that produced on the virgin organ. An extremley important rôle in determining the action of a pharmacological agent is played by various pathological conditions. I have already touched upon this. The same drug acting on a diseased animal or organ may produce a very different effect from that obtained by observations on the normal animal. Another illustration may emphasize this point. Some years ago Dr. Giu Ching Ting collaborating with me on a research concerning the action of various drugs on the Bronchi made a very interesting observation. (5). The action of various drugs was studied on isolated surviving fresh bronchial muscle obtained from the lungs of pigs obtained from a nearby slaughter house and used within an hour after death. It was noted invariably that under certain conditions the muscle preparations while perfectly fresh failed to respond to treatment with various pharmacological agents. An inquiry into the causes of this peculiar phenomenon revealed that in all such cases the animals from which the preparations were obtained were suffering from broncho-

pneumonia. It was evident that the toxin produced in that disease affected the normal response of bronchial muscle. Microscopic sections of normal and diseased lungs obtained in this connection confirmed these deductions. Many other illustrations of the rôle played by the individual or the animal and even in connection with the action of drugs may be cited.

We are just beginning to realize more and more the profound influence exerted by various external factors on the action of drugs. Thus for instance seasonal variations have been noted in connection with the reaction of frogs to various medicaments. Temperature may make an important difference in the action of some drugs. For example when the alkaloid colchicine is injected into a frog's lumph sac little or no effect may be noted if the animal is kept in a cold place. When, however, the animal is taken into a warm room, symptoms of poisoning develop very rapidly. The explanation in this case is not far to seek. It was found that the alkaloid colchicine at higher temperatures decomposes rapidly producing another alkaloid which is responsible for the toxicological effects. The effect of light on the action of drugs is extremely interesting. Not only does light affect the keeping qualities of certain medicinal substances but we know now also that certain rays, especially the ultraviolet, may potentiate or increase the activity of certain drugs. Dr. Teagarden and myself a few years ago published some experiments concerning the effect of ultraviolet rays on the activity of quinine and quinidine sulphates for frogs and rats. (6). These solutions which are fluorescent are much more toxic in light than in the dark. Paramecia have been known to live for a long time in solutions of eosin if kept in the dark. When, however, the same solutions with the animalcules were exposed to sunlight, the little creatures rapidly perished. Bacteria are known to influence the action of a great many drugs and may indirectly produce poisoning under certain circumstances. For instance, insoluble compounds of bismuth such as the subnitrate are often given in gastro-intestinal diseases to act as sedatives to the mucous membranes. Occasionally, through the action of certain bacteria present in the intestines, these compounds are decomposed, forming soluble salts of bismuth which are absorbed producing the characteristic poisonous effects of bismuth ions. Many more illustrations could be adduced concerning the various conditions affecting the action of drugs but we cannot dwell on this subject any longer in this place.

Having studied as far as possible the various conditions affecting drug action, the careful pharmacologist who is examining a new or unknown drug with an ultimate view of applying it in clinical practice must turn his attention to another cardinal line of inquiry. He must consider certain *Therapeutic Data* concerning it. Even after the pharmacological, chemical and physiological properties of a new substance have been thoroughly investigated a great many questions must be answered before proceeding to administer it to patients. The keeping qualities of the drug must be carefully studied and methods for its assay, which very often are purely biological, must be established. This is particularly true of the illustration which I have cited in this discourse, namely, Digitalis. It is well known that preparations of Digitalis are extremely variable in potency and keeping qualities and it is also well known that in order to produce a satisfactory therapeutic effect with this drug a sufficient quantity of a potent preparation must be administered. Having determined to satisfaction the dosage of a drug, its

method of administration must be studied. Drugs may be administered through various channels and the effects produced may vary with the method of administration.

One of the pit-falls of the pharmacologist as well as of the clinical practitioner is the confusion between local and systemic effects of drugs. A medicament such as atropine may be applied to the eye for a purely local effect but it may be absorbed by the lymph sac and blood vessels of the organ and carried into the general circulation, producing symptoms of atropine poisoning. Vermifuges or anthelmintics are given patients in order to expel intestinal parasites. The absorption of such medicaments by the intestines is undesirable and should be avoided. When administered improperly, as for instance in case of the male-fern resin together with oil, absorption may be promoted and serious poisoning will result. Drugs have been used in vaginal douches for purely local effects, but they have been absorbed into the circulation and produced poisoning and even death. Individual susceptibility of patients or so-called idiosyncrasy must receive proper consideration. The therapeutic application of drugs requires furthermore a preliminary inquiry into the possibility of cumulative effects, tolerance, habituation and drug addiction which may result from their use. All these problems come within the sphere of activity of the expert pharmacologist. Many more topics in this connection could be discussed but we must refrain. It is particularly on account of the ultimate therapeutic applications of the results of pharmacological research, that it is very desirable, nay, according to many prominent pharmacologists, it is essential for the well-rounded and well-grounded pharmacologist to have a medical education. I would rather trust my body when sick to the physican, than swallow any medicament urged upon me by ever so learned a chemist, druggist or even a physiologist or biologist.

The enormous number of nostrums, quack remedies and new synthetics flooding the drug market are certainly not to be laid to the activity of pharmacologists. These dangerous or useless articles are foisted upon the public by thoughtless or rapacious chemists or druggists on the one hand, and are prescribed by the insufficiently trained and crude practitioners or charlatans on the other. In almost all such cases there is to be found a lack of pharmacological knowledge concerning them. The well-trained physician knows full well, that the conscientious and thorough pharmacologist will hesitate to urge the therapeutic use of any substance, before he has studied it from every angle, and that, he will even first try the drug himself, before administering it to fellow man.

(To be continued)

OFFICERS-ELECT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The Board of Canvassers of the AMERICAN PHARMACEUTICAL ASSOCIATION, composed of Henry J. Dusterberg, Otto Kistner and J. T. Lloyd, all of Cincinnati, O., has announced as the result of the vote for officers of the ASSOCIATION the election of the following:

President, David F. Jones, Watertown, So. Dakota.

First Vice-President, A. W. Pauley, St. Louis, Mo.

Second Vice-President, W. H. Zeigler, Charleston, So. Carolina.

Members of the Council, H. C. Christensen, Chicago, Ill.; H. A. B. Dunning, Baltimore, Md.; S. L. Hilton, Washington, D. C.

These officers will be installed at the 1928 meeting of the ASSOCIATION.

STUDIES IN SYNTHETIC DRUG ANALYSIS. IX. ESTIMATION OF ACETYLSALICYLIC ACID (ASPIRIN), PHENYLCINCHONINIC ACID (CINCHOPHEN) AND CAFFEINE IN ADMIXTURE.

BY W. O. EMERY.

Among recent problems requiring the attention of this Bureau were two tablet preparations, containing as therapeutic agents aspirin and cinchophen on the one hand, and aspirin, cinchophen and caffeine on the other. While the current U. S. P. assays for both acetylsalicylic acid and phenylcinchoninic acid as such are apparently satisfactory, they make no provision for the isolation of these drugs separately, or as a group, from accompanying excipients and lubricants, nor for their evaluation when exhibited in simple admixture.

The only published attempt to determine cinchophen in the presence of aspirin (and salicylic acid resp.) was recently reported by Warren,[1] who made use of the difficult solubility of silver phenylcinchoninate in hydro-alcoholic media as a means of estimation. The present writer's experience with this method, however, has been less satisfactory, in that the values obtained for cinchophen were invariably high (one to four per cent) with correspondingly low ones for aspirin. It is believed, therefore, that such treatment cannot be relied upon to bring about more than an approximate separation in unknown mixtures.

In formulating the procedure presently to be described in detail, and designed to effect a quantitative group isolation of the active tablet constituents preliminary to their individual estimation, the following considerations were determinative. It was found, namely, that judicious treatment of the finely powdered tablets with aqueous sodium carbonate, and subsequent filtering, yielded a solution from which caffeine could, if present, be readily extracted with chloroform, and weighed. For the separation of aspirin and cinchophen, and their later estimation, the characteristic behavior of salicylates and phenol toward iodized potassium iodide solution (Wagner's reagent) in the presence of alkaline carbonates[2] immediately suggested itself, since a preliminary test had demonstrated the fact that cinchophen is wholly unaffected by this reagent under the experimental conditions observed, whereas aspirin yields the insoluble diiodophenylene oxide, $C_6H_2I_2O$, an obviously suitable compound for determining the salicylic acid nucleus. The clear filtrate obtained after elimination of the aspirin, and containing, in addition to iodides, iodates, and carbonates of sodium and potassium, the cinchophen (as a salt), yields on addition of dilute sulfuric acid in excess, a complex precipitate of iodine, both free and combined with cinchophen as periodide. On extracting this precipitate with an ether-chloroform mixture and treating with sulphurous acid, it is possible to isolate and weigh the cinchophen directly.

In the absence of caffeine, an alternative volumetric method for cinchophen suggests itself, based on the behavior of this substance, either alone or admixed with aspirin, toward iodized potassium iodide in the presence of glacial acetic acid. Thus, a solution of cinchophen in this acid yields with the iodine reagent in excess a black crystalline precipitate of the essential composition, $(C_{16}H_{11}NO_2)_2.HI.I_3$,

[1] Jour. A. Ph. A., 16, 32 (1927).

[2] Emery, *Ind. & Eng. Chem.*, 13, 538 (1921).

a periodide practically insoluble in the reacting menstruum and eminently suited to serve as a basis for volumetric estimation.[1]

EXPERIMENTAL.

The appended analytical findings are representative of many determinations carried out on both control and commercial mixtures. The individual components for these controls were selected from both domestic and foreign brands, and carefully checked as to purity. A specially purified cinchophen was obtained by means of the isatine-acetophenone synthesis of Pfitzinger,[2] and subsequent treatment with aqueous acetic acid. In general, the preliminary treatment of tablets consisted in exhausting the finely powdered sample with dilute sodium carbonate solution and filtering off the inert vehicular matter on a small suction plate.

METHOD I.

Caffeine.—In a small tared 50-cc. beaker weigh out an amount of the finely powdered tablets containing not to exceed 0.3 Gm. of aspirin and cinchophen known or believed to be present, add 1 Gm. of anhydrous sodium carbonate and 10 cc. of water, stirring the mixture from time to time over a period of one-half hour. Pass through a small suction filter and plate into a 50-cc. Erlenmeyer, washing out the beaker and funnel with three 5-cc. portions of water. Transfer the aqueous liquid to a 150-cc. Squibb separatory funnel and extract by vigorous shaking with four 25-cc. portions of chloroform withdrawing when clear to a second separatory funnel and washing successively with 5 cc. of water. Pass each portion of chloroform through a dry 5.5-cm. filter into a 50-cc. tared beaker, evaporate the solvent by a gentle air blast, and weigh the residual caffeine.[3]

Aspirin.—Withdraw the aqueous alkaline liquids from both separatory funnels into a suitable evaporating dish and heat to dryness on a steam-bath, in order to expel all traces of alcohol taken up from the chloroform. If the sample under examination contains no caffeine, the above indicated treatment for its isolation becomes superfluous. Dissolve the alkaline residue containing the aspirin and cinchophen as salts in 25 cc. of warm water, transfer by filtration if necessary to a 400-cc. Erlenmeyer, add 1.5 Gm of anhydrous sodium carbonate (1 Gm. for each 100 mg. aspirin known or believed to be present), diluting with water to about 200 cc. Heat on the steam-bath and add from time to time 10-cc. portions of 0.2 *N* iodine,

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[1] A more detailed description of this compound, and of a lower copper-colored periodide, $(C_{16}H_{11}NO_2)_2.HI.I_2$, will appear in a later communication. Rabak, *J. Assocn. Official Agr. Chem.*, 1, 33 (1923), has already reported the formation of an iodine addition-product on adding a 0.1 *N* iodine solution to cinchophen in acetic acid, but was unable to develop any satisfactory method based on this observation.

[2] *J. prakt. Chem.*, (2) 38, 583 (1888).

[3] Except in specially prepared controls, it will be found that most, if not all, commercial brands of cinchophen carry an impurity which follows the caffeine on its extraction with chloroform. As a means of approximate purification, rub up the residual caffeine with 5 cc. of warm water, allow to stand one-half hour, then pass through a minute moistened filter into a small tared beaker, evaporate the filtrate by means of an air blast, and weigh the resulting crystals. Obvious precautions must of course be taken in this and similar operations to insure the quantitative transfer of dissolved substance by judicious washing of filter edges, funnel and separatory funnel tips, etc., with the respective solvent.

until after the final addition and protracted heating an excess of the reagent is apparent. Add 0.5 Gm of sodium carbonate and continue heating one hour, then filter hot through a tared Gooch, washing the reddish purple precipitate with about 200 cc. of hot water. Dry in an air-bath at 100° to constant weight. The weight of the precipitate multiplied by the factor 0.5238 yields the quantity of aspirin originally present in the sample taken.

Cinchophen.—Evaporate the filtrate on a steam-bath to about 10 cc., care being taken to avoid separation of iodine, then transfer the salt mixture by pouring and washing with a minimum of water to a 150-cc. separatory funnel, so that the final volume of liquid does not exceed 35 cc. Now add slowly 15 cc. of 10% sulfuric acid (sufficient at least for complete acidification) with constant agitation, whereupon the cinchophen is precipitated as periodide along with an excess of free iodine. Extract with four 50-cc. portions of a mixture of 40 cc. of chloroform and 10 cc. of ether, transferring the chloroform-ether mixture when reasonably clear to a second separatory funnel containing 5 cc. of a saturated aqueous solution of sulphurdioxide. Shake vigorously, then add, if necessary, a few more drops of sulphurous acid, sufficient to develop a bright yellow to straw color in the reacting media. Draw off the chloroform-ether mixture into a third separatory funnel containing 10 cc. of water. Shake moderately, whereupon the liquids should become colorless. Withdraw the lower layer through a small dry 5.5-cm. filter into a tared 100-cc. Erlenmeyer, and evaporate the solvents at a very gentle heat and with a moderate air blast nearly to dryness. Carry out the succeeding three extractions substantially as above indicated, except that in the third and fourth operations the addition of one to two drops of sulphurous acid to the contents of the first separatory funnel will be found advantageous in reducing superfluous free iodine. Familiarity with the method will soon enable one to determine the quantity of sulphurous acid conducive to smoothest operation. After the several chloroform-ether portions have been successively applied and united with the first, and the mixture finally evaporated to a few cubic centimeters, continue with a very gentle air blast but without the application of heat until the cinchophen separates as a crystallin mass, then heat at 100° in an air-bath to constant weight. Cinchophen thus isolated should be quite or nearly colorless.[1]

METHOD II.

Cinchophen.—In the absence of caffeine, the following volumetric procedure may be used. Evaporate the solution of aspirin and cinchophen in aqueous sodium carbonate to dryness on the steam-bath and with air blast, then transfer the residual salts by solution in a minimum of glacial acetic acid to a 100-cc. volumetric flask, so that the resulting liquid does not greatly exceed 15 cc. Heat nearly to boiling and run in with constant rotation of the flask, from a burette or pipette, 25 cc. of a 0.1 *N* iodine solution. Stopper and allow to cool to room temperature, agitating the mixture from time to time. Fill to mark with water, mix thoroughly by repeated inversion and set aside for one-half hour. Withdraw a 50-cc. aliquot of

[1] Palkin has recently shown (JOUR. A. PH. A., 16, 634 (1927)) that cinchophen can be extracted from aqueous acid media quantitatively by immiscible solvents. Another method described by the same author depends upon the extraction of cinchophen as a bromine-addition-product by means of ether. Both methods were inapplicable to a solution of the problem in hand.

clear liquid, obtained by passing through a small (5.5-cm.), dry, closely-fitted filter into a graduated 50-cc. flask, rejecting, however, about 15 cc. of the first runnings. Transfer the aliquot by pouring and washing to a 200-cc. Erlenmeyer and titrate with 0.1 *N* sodium thiosulphate solution.

RESULTS BY METHOD I.

Series A.

Amounts taken.			Amounts found.		
Caffeine.	Aspirin.	Cinchophen.	Caffeine.	Aspirin.	Cinchophen.
....	0.1500	0.1500 grams	....	0.1509	0.1498 grams
....	0.1500	0.1000 grams	....	0.1511	0.1005 grams
....	0.1500	0.1300 grams	....	0.1503	0.1299 grams
....	0.1500	0.1500 grams	....	0.1493	0.1496 grams
....	0.1500	0.1300 grams	....	0.1495	0.1296 grams
....	0.1500	0.1500 grams	....	0.1499	0.1506 grams
0.0081	0.1620	0.1620 grams	0.0080	0.1628	0.1618 grams
0.0081	0.1296	0.1620 grams	0.0082	0.1287	0.1615 grams
0.0081	0.1620	0.1296 grams	0.0080	0.1625	0.1291 grams

Series B.

1/8	2.5	2.5 grains	1/8	2.35	2.30 grains
1/8	2.5	2.5 grains	1/8	2.45	2.43 grains
...	...	7.5 grains	...	...	7.41 grains
...	...	7.5 grains	...	...	7.46 grains
...	2.5?	2.5? grains	...	2.48	2.31 grains
...	2.5?	2.5? grains	...	2.31	2.37 grains

RESULTS BY METHOD II.

Series C.

...	...	0.0500 grams	...	...	0.0492 grams
...	...	0.1000 grams	...	...	0.1005 grams
...	...	0.1500 grams	...	...	0.1495 grams
...	...	0.2000 grams	...	...	0.2008 grams

Series D.

...	...	0.0500 grams	...	...	0.0495 grams
...	...	0.1000 grams	...	...	0.0996 grams
...	...	0.1500 grams	...	...	0.1504 grams
...	...	0.2000 grams	...	...	0.2002 grams

Series E.

...	...	0.0500 grams	...	...	0.0496 grams
...	...	0.1000 grams	...	...	0.0999 grams
...	...	0.1500 grams	...	...	0.1500 grams
...	...	0.2000 grams	...	...	0.2003 grams
...	0.1500	0.1500 grams	...	...	0.1507 grams
...	...	0.1296 grams	...	...	0.1298 grams
...	0.1620	0.1620 grams	...	...	0.1626 grams

Since the composition of the black insoluble iodine addition-product constituting the basis for the foregoing operation was found on analysis to be $(C_{16}H_{11}NO_2)_2.HI.I_3$, it will be noted that for every molecule of cinchophen the equivalent of 1.5 atoms of iodine is required, hence from a titrimetric standpoint one atom of iodine is equivalent to a two-thirds molecule of cinchophen. If, therefore, the quantity of iodine expended in the formation of insoluble periodide is ascertained as the result of such titration, the quantity of cinchophen is readily calculated from the expression:

$$\text{cinchophen} = I(0.0016609 \times N),$$

in which 0.0016609 represents the quantity of cinchophen in 1 cc. of a 0.1 *N* solution of this substance; N, the normality of standard sodium thiosulfate employed; and I, the number of cubic centimeters of such thiosulphate corresponding to the iodine entering into combination with cinchophen isolated as periodide.

The above procedure was developed essentially for application to mixtures of aspirin and cinchophen, but there is every reason to believe it might serve as a works' method in the evaluation of cinchophen tablets, the powdered sample could be directly extracted with hot acetic acid, and the solution filtered into the volumetric flask for treatment with iodine, thus eliminating the preliminary extraction with aqueous sodium carbonate.

The samples examined under Series B represent various commercial tablets, and their therapeutic content in grains, indicated under amounts taken, is that claimed by the manufacturer. All the other series involve controls. In Series C the iodine was added slowly to the acetic acid solution of cinchophen, whereas in Series D the cinchophen solution was added rapidly to the iodine. In Series E the order of treatment was like C, except that the addition of iodine was rapid. So far as final results are concerned it would appear immaterial whether the addition of iodine to cinchophen is slow or rapid.

SUMMARY.

Two methods are described, the one, gravimetric for the evaluation of aspirin and cinchophen, or of aspirin, cinchophen and caffeine in admixture, the other volumetric for the estimation of cinchophen with or without the presence of aspirin. By the first, caffeine is isolated by extraction with chloroform from a solution of the mixture in aqueous sodium carbonate. Separation of aspirin from cinchophen is effected by conversion of the former to the characteristic diiodophenylene oxide, $C_6H_2I_2O$, which is filtered off and weighed. The cinchophen is thereupon precipitated from the acidified filtrate as the periodide, $(C_{16}H_{11}NO_2)_2.HI.I_3$. The latter is extracted with an ether-chloroform mixture, then deiodized by aqueous sulphurous acid. The liberated cinchophen is recovered and weighed as such. By the second method, the cinchophen, either alone or admixed with aspirin, is converted to the above periodide in aqueous acetic acid, the resulting menstruum is diluted to a measured volume and the unexpended iodine determined in an aliquot by titration. The data thereby obtained serve as a basis for volumetric estimation.

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PROGRESS OF MEDICINE.

The *Washington Post* of January 8th devotes two pages of its "Magazine Section" to an interesting and informative article by Surgeon-General Hugh S. Cumming on "The Progress of Medicine." The Surgeon-General closes with the following comment:

"Great as have been the triumphs of modern preventive medicine, the problems remaining for solution are still greater. The hope of the future lies in the continued and increasing growth of scientific knowledge which can be applied to the protection against disease, and the promotion of the public health."

THE STANDARDIZATION AND STABILIZATION OF NUX VOMICA, GELSEMIUM AND VERATRUM AND THE HYDROGEN-ION CONCENTRATION FACTOR.—PAPER IV.

BY E. E. SWANSON AND C. C. HARGREAVES.

I. Introduction
II. Data on Nux Vomica
III. Data on Gelsemium
IV. Data on Veratrum
V. Conclusions

I. INTRODUCTION.

In three previous articles (1, 2, 3), the standardization and stabilization of aconite preparations were reported. This report included the study of a bio-assay method, the deterioration of preparations of aconite, the unreliability of the chemical assay method, the prevention of deterioration, the cause of deterioration or hydrolysis of the aconitine alkaloid into the less potent alkaloids benzyl aconine and aconine, and finally the hydrogen-ion concentration, which was shown to control the deterioration and stabilization. Inasmuch as it was found that this factor controls the value of aconite preparations, the writers have studied it in relation to other drug preparations with the idea that perhaps each fluidextract and tincture has a hydrogen-ion concentration or p_H value which controls its deterioration and stabilization.

The drugs or fluidextracts of drugs chosen were fluidextracts of Nux Vomica U. S. P. IX, Gelsemium U. S. P. IX and of Veratrum U. S. P. IX. The chemical properties and chemical assay methods of the alkaloids of Nux Vomica, strychnine and brucine, are well known and are considered very stable in fluidextracts and tinctures. On the other hand, the tinctures and fluidextracts of Gelsemium and Veratrum are not so stable, the chemical assay methods being considered less reliable, therefore requiring a physiological assay.

II. DATA OF FLUIDEXTRACT OF NUX VOMICA U. S. P. IX.

Eleven samples of Fluidextract of Nux Vomica U. S. P. IX were selected, one for each year beginning 1917 to 1927 inclusive, each sample tested chemically and physiologically (White Mice, Lethal Dose Method). The following table represents the year made, chemical assay, bio-assay and per cent activity:

TABLE I.—FLUIDEXTRACT OF NUX VOMICA U. S. P. IX SAMPLES.

Sample.	Year made.	Chemical assay per cent total alkaloids.	Bio-assay M. L. D. M.	Bio-assay per cent.
1	1917	2.55	0.00015	100
2	1918	2.53	0.00015	100
3	1919	2.45	0.00015	100
4	1920	2.52	0.00015	100
5	1921	2.31	0.00015	100
6	1922	2.52	0.00015	100
7	1923	2.59	0.00015	100
8	1924	2.61	0.00015	100
9	1925	2.77	0.00015	100
10	1926	2.63	0.00015	100
11	1927	2.487	0.00015	100

Table I shows no loss in activity, either chemically or physiologically, over a period of ten years.

A fluidextract of Nux Vomica U. S. P. IX, was prepared, March 7, 1927, divided into eight parts, seven of these samples received various amounts of hydrochloric acid, the hydrogen-ion concentration determined in each sample, tested chemically for strychnine and brucine alkaloids and physiologically assayed. The following Table II represents the results of six months' aging.

TABLE II.—FLUIDEXTRACT OF NUX VOMICA U. S. P. IX.

Hydrogen-Ion Concentration Factor.

Sample no.	HCl Gm. in 100 cc.	P_H.	Bio-assay M. L. D. M.	Bio-assay per cent.	Chemical assay per cent total alkaloids.	Chemical assay strychnine.	Chemical assay brucine.
1	0.360 Gm.	0.75	0.00015	100	2.469	1.062	1.407
2	0.288 Gm.	1.92	0.00015	100	.....	.....	.....
3	0.144 Gm.	3.98	0.00015	100	.....	.....	.....
4	0.072 Gm.	4.20	0.00015	100	.....	.....	.....
5	0.036 Gm.	4.60	0.00015	100	.....	.....	.....
6	0.018 Gm.	4.83	0.00015	100	.....	.....	.....
7	0.009 Gm.	5.03	0.00015	100	.....	.....	.....
8	none	5.30	0.00015	100	2.484	1.052	1.432

The above table shows that the hydrogen-ion concentration does not control the deterioration or stabilization of Fluidextract of Nux Vomica U. S. P. IX., no acid being required to control its therapeutic value. Charts I and II represent the curve of aging and hydrogen-ion concentration.

III. DATA ON FLUIDEXTRACT OF GELSEMIUM U. S. P. IX.

The alkaloids of gelsemium have been extensively studied over a period of years by Sayre and his co-workers, (4, 5, 6, 7, 8, 9, 10). The alkaloids of gelsemium according to these investigators, are gelsemine, gelseminine and sempervirine, the principal alkaloid being gelseminine. The chemical assay is not considered reliable. Pittenger has described a physiological assay method (11), which is more accurate than the chemical method.

The following table represents data on samples of fluidextract of Gelsemium U. S. P. IX, 1917 to 1927 inclusive, each sample tested by the chemical and physiological method (White Mice, Lethal Dose Method).

TABLE III.—FLUIDEXTRACT OF GELSEMIUM U. S. P. IX SAMPLES.

Samples.	Year made.	Chemical assay.	Bio-assay M. L. D. M.	Bio-assay per cent.
1	1917	0.521	0.00020	100
2	1918	0.490	0.00025	80
3	1919	0.525	0.00035	57.1
4	1920	0.550	0.00025	80
5	1921	0.490	0.00040	50
6	1922	0.510	0.00030	$66^2/_3$
7	1923	0.520	0.00025	80
8	1924	0.506	0.00035	57.1
9	1925	0.540	0.00025	80
10	1926	0.572	0.00030	$66^2/_3$
11	1927	0.530	0.00025	80

The above data show that the chemical and physiological methods do not correlate.

A fluidextract of Gelsemium U. S. P. IX was prepared on March 7, 1927, this was divided into 8 parts, 7 parts received various amounts of acid (HCl), the hydrogen-ion concentration of each sample determined and assayed chemically and biologically. The following table represents the data of six months' aging.

The determination of the hydrogen-ion concentration in fluidextract of Gelsemium is very difficult. The method found to give the best results is to dilute the fluidextract 1:2, filter and then make the p_H reading or determination.

TABLE IV.—FLUIDEXTRACT OF GELSEMIUM U. S. P. IX.

Hydrogen-Ion Concentration Factor.

Sample no.	HCl Gm. in 100 cc.	p_H.	Bio-assay M. L. D. M.	Bio-assay per cent.	Chemical assay.
1	0.360 Gm.	less than 1	0.00025	100	0.568%
2	0.288 Gm.	less than 1	0.00025	100	.....
3	0.144 Gm.	1.12	0.00025	100	.....
4	0.072 Gm.	2.43	0.00025	100	.....
5	0.036 Gm.	2.87	0.00025	100	.....
6	0.018 Gm.	3.15	0.00025	100	.....
7	0.009 Gm.	3.25	0.00025	100	.....
8	None Gm.	3.45	0.00025	100	0.572%

The above data show that the hydrogen-ion concentration does not control the deterioration and stabilization of Gelsemium. No acid is required to prevent deterioration in 6 months' time, however the sample with no acid has a distinct acid reaction and a p_H value of 3.45.

IV. DATA ON FLUIDEXTRACT OF VERATRUM U. S. P. IX.

The chemistry of veratrum alkaloids has been studied by Eden, (12), the pharmacological action by Pilcher and Sollmann, (13). The chemical assay of veratrum alkaloids as concluded by several authorities is not an indication of its therapeutic value. Houghton and Hamilton, (14), in 1905 reported the assay of a veratrum preparation on frogs; later, Pilcher, (15), reported a bio-assay method on frogs, and still more recently Rowe, (16), described the use of mice as a bio-assay method.

The following data represent the assay by the chemical and bio-assay (White Mice, Lethal Dose Method) methods of Fluidextract of Veratrum U. S. P. IX, samples made in 1920 to 1927, inclusive.

TABLE V.—FLUIDEXTRACT OF VERATRUM U. S. P. IX SAMPLES.

Sample.	Year made.	Chemical assay.	Bio-assay M. L. D. M.	Bio-assay per cent.
1	1920	1.020	0.00080	31
2	1922	0.940	0.00035	71
3	1923	1.029	0.00040	62.5
4	1924	1.010	0.00040	62.5
5	1925	1.060	0.00035	71
6	1927	1.080	0.00065	38.4

The above data show that the chemical method is unreliable and does not correlate with the bio-assay method.

A fluidextract of Veratum U. S. P. IX was prepared on March 7, 1927. This preparation was divided into 8 parts, to 7 parts various amounts of HCl were added, the hydrogen-ion concentration of each sample determined. Each sample

was assayed chemically and biologically. The following data represent 6 months' aging.

TABLE VI.—FLUIDEXTRACT OF VERATRUM U. S. P. IX.

Hydrogen-Ion Concentration Factor.

Sample no.	HCl Gm. in 100 cc.	P_H	Bio-assay M. L. D. M.	Bio-assay per cent.	Chemical assay.
1	0.360 Gm.	0.97	0.0060	4	1.066%
2	0.288 Gm.	1.15	0.0045	5	.....
3	0.144 Gm.	1.63	0.00095	26	.....
4	0.072 Gm.	3.12	0.00050	50	.....
5	0.036 Gm.	4.02	0.00055	45	.....
6	0.018 Gm.	4.37	0.00050	50	.....
7	0.009 Gm.	4.55	0.00050	50	.....
8	none	5.07	0.00070	35.7	1.047%

The above data indicate that the hydrogen-ion concentration will control the deterioration and stabilization of veratrum. Further study is necessary to determine definitely the required hydrogen-ion concentration.

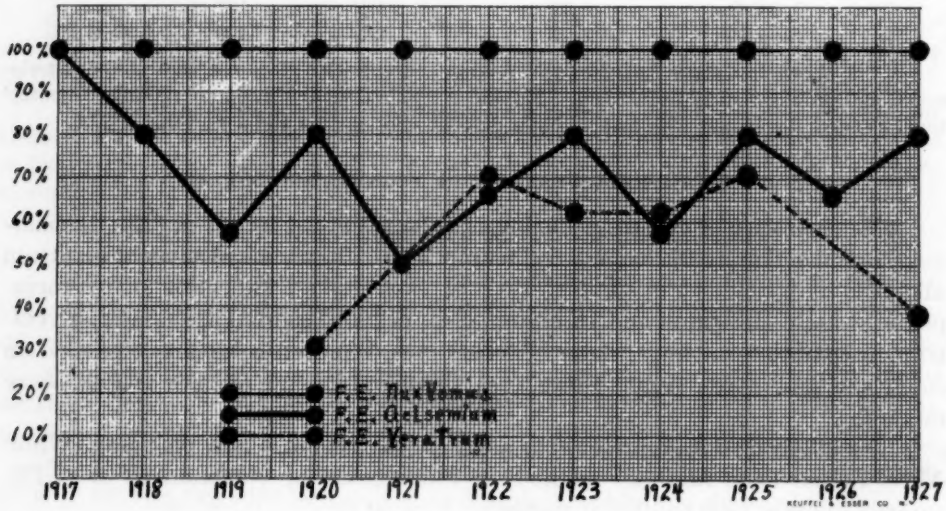

Chart I.—Aging test.

In Chart I the curve shows variation in the biological assay of samples prepared in the last seven years. In Chart II the hydrogen-ion concentration seems to show some control of the stability and deterioration of veratrum. The two curves represent the assay of the fluidextract of Veratum U. S. P. IX, with water dilution and 50% alcohol dilution. The water dilution shows a more regular constant curve.

CONCLUSIONS.

A discussion of the above data leads one to believe that not all fluidextracts require a definite hydrogen-ion concentration to control their deterioration and stabilization. Fluidextract of Nux Vomica U. S. P. IX is stable and requires no hydrogen-ion concentration factor, the chemical method and bio-assay method giving correlative results.

The fluidextract of Gelsemium U. S. P. IX requires no definite hydrogen-ion concentration to stabilize its alkaloids. However, the chemical method is not reliable and this preparation should be biologically assayed.

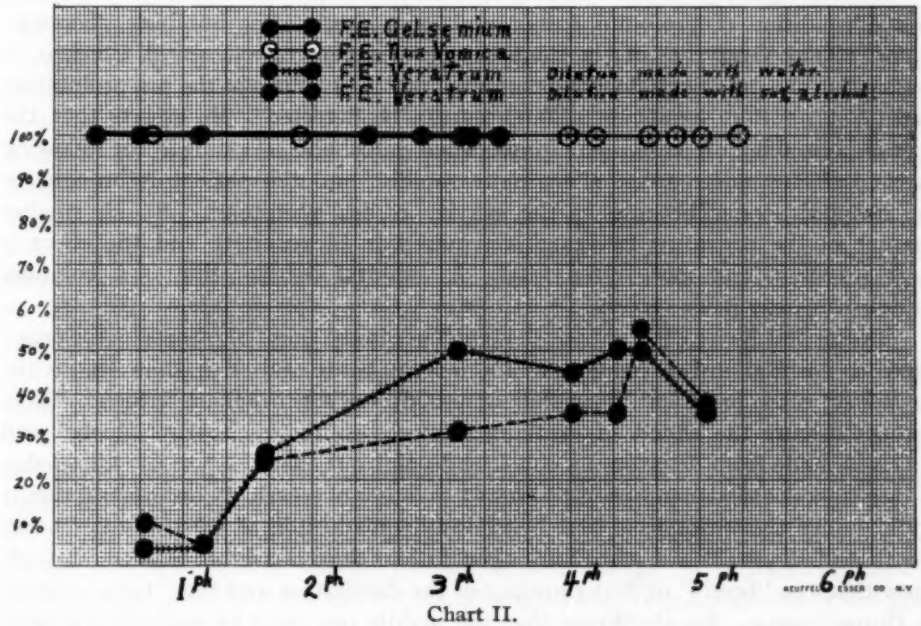

Chart II.

The fluidextract of Veratrum U. S. P. IX seems to require some definite hydrogen-ion concentration to control its deterioration and stabilization. The chemical method is unreliable and should be assayed biologically.

The writers are much indebted to A. L. Caldwell for p_H determinations, to Walter Hoover for alkaloidal determinations and to H. W. Rhodehamel and Miss Lucile Carter for suggestions and criticisms.

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THE POISON IN ILLICIT LIQUOR.

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Since the passage of the Volstead Law attention has been repeatedly directed to the condition of profound stupor and even death after imbibing "bootleg" liquor. Thus Gerty (1) of the Cook County Psychopathic Hospital, Chicago, in contrasting the prevalent alcoholic poisoning with alcoholism of the pre-prohibition variety states that significant differences can be detected. He asserts that the type of poisoning now seen differs from ordinary alcoholic poisoning in the following ways: 1. The poison takes effect more rapidly, and the patient is brought to the hospital sooner because of the gravity of his symptoms. 2. A smaller amount of the prevalent beverage is required to incapacitate and the effect is more profound and more often fatal. 3. Mental deterioration is a common sequel, even after a few sprees.

Doran and Beyer (2) point out that evidence in the shape of reports by the press; heads of hospital staffs; public officials, federal, State and city; show that while alcoholism is less prevalent, its attendant and after effects are more serious. These authors discuss the effects of drinking mixtures containing methyl alcohol and mixtures made from denatured alcohol, and point out that the popular knowledge of these facts has led many people to resort to liquor of seemingly known and recent origin under the impression that being locally made it is at least safe and pure. Doran and Beyer (2) also say that for generations the moonshiner of the mountains knew that the "heads" or first runnings of the distillation and the "tails" should be thrown away. He also knew that the middle run must be redistilled several times in order to make what was to him a passable "mountain dew." He was also extremely careful of his yeast. He did not know that the heads were high in aldehydes or that the tails were high in fusel oil, yet he knew by experience that unless he did do these things even the strong man of the hills could not stand up under the load. From this old practice there developed the large controlled grain distillery. Even the distillery product is not considered potable when first made but is aged in wooden barrels for years before being considered fit for sale as beverage liquor.

Crompton and Tolman (3) in a very extensive series of whisky analyses covering all ages of legitimately made whiskys, showed conclusively that the fusel oil content of whisky was not eliminated on aging as long as eight years but is even increased. The harmful effect of new whisky is therefore not due to its fusel oil content. In the aging of whisky in wood there is a slow reaction between small quantities of organic acids and higher alcohols with the formation of highly flavoring and odorous esters. These changes are slight, however, and do not seem sufficient to Doran and Beyer to account for the marked difference in the physiological effects noted when new or raw whisky is compared with old.

Doran and Beyer (2) as a result of many thousands of analyses, found that whisky which was brought into the laboratory in connection with raids on moonshine distilleries usually showed a high content of aldehyde. The "ranker" the liquor, the higher the aldehyde content. They explain this by pointing out that

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the moonshiner does not control the fermentation of his mixture and there results a considerable oxidation of the ethyl alcohol into acetaldehyde and even acetic acid. The simple pot still and their eagerness for more profits in not discarding heads and tails does the rest and the resulting liquor presented to the trusting purchaser has everything needed to produce a knockout.

Doran and Beyer (2) find an average aldehyde content of 30 parts per one hundred thousand for their samples of moonshine as compared with an average aldehyde content of 3.9 parts per one hundred thousand, as found by Crompton and Tolman, (3) for new whisky made under better conditions in pre-Volstead days. The fusel oil and the other constituents in the two series are essentially the same. Doran and Beyer also found traces of copper and zinc salts in their samples. Since aldehydes are so markedly increased these authors advance the hypothesis that this is the toxic substance present in moonshine liquor, but performed no animal experiments. They point out that these aldehydes can be removed by more careful fractionating and by polymerization on aging in wood.

Statistics collected by McNally (4) of the Cook County Coroner's Office also show that deaths from alcoholism are on the increase. His chemical analyses of illicit liquors failed to show a definite toxic substance responsible for the increase in deaths. He gave moonshine liquor in daily doses of 1 cc. to rats and found that they died in a few months. A second series of rats was given for many months 2 cc. per day of a solution containing 200 parts of acetaldehyde per one hundred thousand in 50 per cent alcohol without causing death. A third series used as controls were given 1 cc. per day for many months of pure grain alcohol of the same strength without harm. Hence, these results of McNally indicate that the toxic substance present in moonshine is not acetaldehyde since the quantity of similar substances administered was much higher than found by Doran and Beyer (2) in moonshine.

Hunt (5) also hesitates to believe that this compound is responsible for the harmful effect of illicit liquors; for, as he points out, acetaldehyde is only seven or eight times as poisonous as ethyl alcohol itself and in the samples analyzed by Doran and Beyer there was on an average about fifteen hundred times as much alcohol as acetaldehyde. A person would have to consume almost his own weight of the liquor in order to get a fatal dose of acetaldehyde; of course he would die of alcoholic poisoning long before he could get a dangerous dose of acetaldehyde (Hunt).

Hunt's own investigations of samples of illicit liquors alleged to have caused death in man have demonstrated their toxicity for animals to be fully accounted for by the ethyl alcohol they contained; he is inclined to think that, unless the victims of such poisoning had taken something besides the liquor analyzed, the results were due to the quantity of alcohol drunk or the manner in which it was taken, rather than to its quality. The depth of intoxication and the danger to life depend, as Hunt points out further, on the concentration of alcohol in the blood, and this is determined not only by the amount of alcohol taken but also by its concentration. There is a rather small margin between the amount of alcohol in the blood necessary to cause deep intoxication and that sufficient to cause death; hence, if a person takes a large amount of strong alcohol within a short time, he may get enough to cause not only intoxication but even death.

In this connection Mellanby (6) found 0.446 per cent alcohol in the blood of dogs produced only slight intoxication; 0.468 per cent resulted in profound collapse. Other reports indicate a greater margin of safety.

The condition of profound stupor and even death sometimes ascribed to a bad grade of moonshine may be thus due to its ethyl alcohol content alone. It may be explained by the tendency of some individuals to exceed their normal capacity when unwillingly deprived of their accustomed liquor for a prolonged period on account of the difficulty of obtaining it.

Studies of MacNider (7) indicate that ethyl alcohol administered to animals (dogs) over a period of six to twelve weeks in daily doses of 10 cc. per Kg. of a 40 per cent solution is only slightly nephrotoxic. Naturally nephropathic animals are more susceptible to the toxic effect of the same amount of alcohol than are normal individuals of the same species. However, when normal dogs are given instead of pure alcohol an equivalent dose of alcoholic distillate obtained without refining from a fermented mixture of corn meal and molasses, there develops evidence of its nephrotoxic action, which is shown functionally by a pronounced albuminuria. On nephropathic animals, the effect is even more pronounced. Associated with a reduction in urine formation occurs a decrease in the elimination of phenol-sulphonephthalein, a retention of non-protein nitrogen in the blood and a reduction of its alkali reserve. Fatty changes arise in the glomerular vessels, and the tubular epithelium also may show evidence of injury. According to MacNider, the toxicity of the unrefined "distillates" from the fermentated mixtures is not primarily due to their content of ethyl alcohol but to some undetermined substance. Purified ethyl alcohol should not be held responsible for the insidious harm that even small quantities of undesired accompaniments in crude distillates may bring about.

"Traces of allyl alcohol if produced in the fermentation tend to be eliminated along with fusel oil in alcoholic distillation and when fusel oil is refined, accumulates in the normal propyl fraction, where the amount may reach 3 per cent or more. The pungent odor and the marked physiological action of some of the fusel oil products are probably due almost entirely to their allyl content." (8*a*) This unsaturated alcohol is discussed in greater detail later.

Attempts have also been made to explain the poisonous properties of illicit liquors as due to their content of "fusel" oil. Crompton and Tolman found that new whiskys contained an average "fusel" oil content of 95.2 parts per one hundred thousand and that it remained practically unchanged after aging. This is practically the same as found by Doran and Beyer (2) in seized moonshine liquors. For these reasons the poisonous properties of properly distilled liquors are not due to the fusel oil content. However, the situation may be very different when the distillation is carelessly done and the "tails" are not rejected. Many car loads of fusel oil are obtained annually as a by-product of legally conducted distilleries. Some moonshiners, however, operated under very crude conditions and do not remove the fusel oil. One crude still seized consisted of a metal gasoline drum and a piece of pipe. Under the best conditions "fusel" oil is not a factor in increasing the poisonous properties of illicit liquors but under bad conditions it may well be especially in the case of chronic drinkers.

"Fusel Oil" is an impure mixture of higher alcohols, principally amyl alcohol.

It is used as a solvent for paints and in chemical industries; the inhalation of vapors may cause headache and palpitation of the heart. Animal experimenters show it to be about 40 times as toxic as ethyl alcohol and a few cases of poisoning in human beings have been reported.

The toxicity of alcohols, at least in acute intoxication, increases up to a certain point with the size of the molecule; thus, ethyl alcohol is more toxic than methyl, propyl alcohol is more toxic than ethyl alcohol, butyl more toxic than propyl and amyl more toxic than butyl, and primary alcohols more toxic than secondary alcohols.

The following table is based on the lethal dose of these alcohols for cats (Macht) (9):

	Formula.	Molecular weight.	Toxicity.
Methyl alcohol	CH_3OH	32	1.0
Ethyl alcohol	C_2H_5OH	46	1.2
Propyl alcohol	C_3H_7OH	60	2.95
Butyl alcohol	C_4H_9OH	74	19.7
Amyl alcohol	$C_5H_{11}OH$	88	39.0

This table holds true for the relative toxicity in acute poisoning but does not tell the entire story in reference to methyl alcohol in subacute poisoning because it does not take into account the secondary effect of methyl alcohol on the optic nerve. These figures are not exact for man but the toxicity for man is probably *greater* than shown because poisons which affect the highly differentiated nerve structures very powerfully are proportionally more dangerous the more highly developed the nervous system of the animal.

COPPER AND LEAD.

Mallory (10) using rabbits showed that copper acetate causes hemo-chromatosis (pigment cirrhosis of the liver). Analysis of a limited number of samples of distilled liquors showed from a trace to 185 mg. of copper per liter, evidently derived from the solvent action of organic acids on the copper worm of the condenser. Mallory also says that the Director of the Division of Foods and Drugs of the department of Public Health of Massachusetts has tested 798 samples of "hooch" and found copper present from a trace up to 32 mg. to the liter in 10.8 per cent. Samples of even "home brew" have been found on chemical examination to show the presence of 25 mg. of copper to the liter. A man drinking a quart of whisky per day containing the maximum amount of copper found, will take into his system about a gram of copper per week which is comparable to the amount required slowly (2 months) to produce pigment cirrhosis in rabbits and monkeys. Several cases having an alcoholic history and coming the post-mortem table had pigment cirrhosis of the liver but did not have an increased content of the copper in the liver. Several cases exposed to occupational hazards of copper also had pigment cirrhosis but no increased copper in the liver. Therefore, under maximum conditions copper may be the toxic element in moonshine liquor but such a possibility is remote.

Vaughan (11) reports three cases of lead poisoning apparently due to whisky which he found to contain lead probably derived from the distilling apparatus.

"Bootleg" liquors are not only raw home brew products, but are also synthetic preparations, sometimes, made from denatured alcohol. New York City authorities (12) state that more than 450 people died in New York City alone during 1924 as a result of taking moonshine or hootch. Some of it is made from wood alcohol and ethyl alcohol denatured with wood alcohol, benzene, bichloride of mercury, ether, kerosene, fusel oil, sulphuric acid, diethylphthalate, propyl alcohol, phenol, formaldehyde and many other substances.

Prohibition enforcement officials at New York City claim that about 20% of the stuff sold in New York City is smuggled into this country, the remaining being manufactured here, mostly from partially denatured alcohol intended for industrial purposes obtained under permits issued to bootleggers under three formulas, known as 39A, 39B and 40.

The first formula is for the manufacture of barbers' supplies, liniments and rubbing alcohols, and is denatured with acetone, isopropyl alcohol, quinine alkaloids and benzene; the second formula is for cleansing soaps for the kitchen and for stove and shoe polish, and is denatured with diethylphthalate and benzene; the third formula is for the manufacture of perfumes and cosmetics and is denatured with brucine, acetone and isopropyl alcohol. Instead of making it into these substances, the denatured alcohol is made into "Old Scotch" and "Gordon Gin" and "Jamaica Rum."

The Connecticut Agriculture Experiment Station (13) investigated samples of alleged whisky and found aside from one series containing wood alcohol no foreign substance which in kind or amount could be regarded as a probable cause of death. Much of the alcohol used in preparation of present-day liquors is obtained by the rectification of denatured alcohol, particularly the specially denatured type. Such alcohols generally show on analysis traces of denaturants that have carried over in the process of purification. There is no authoritative opinion that traces of such substances as diethylphthalate, isopropyl alcohol, benzene and acetone are likely to produce serious effects. However, there is always the possibility of inefficient purification with increased danger. In nearly half of the Connecticut samples tested the alcohol appeared to have been derived wholly, or in part, from denatured alcohol.

WOOD ALCOHOL.

Wood alcohol poisoning has repeatedly occurred from drinking bootleg liquors (14, 15). The wood alcohol has been used through ignorance and has been used as the only alcohol present or has been derived from grain alcohol denatured with methyl alcohol. Wood alcohol poisoning was known before the passage of the Volstead Act. Even in 1910 (15) wood alcohol was a fairly constant ingredient of the cheaper wines, brandies and whiskies sold in the low resorts of the East Side, in proportions ranging from 24 to 43 per cent and has been repeatedly found in soft drinks and toilet preparations.

Methyl alcohol is usually obtained from the destructive distillation of wood, although it is also made synthetically. Crude samples of wood alcohol have an extremely disagreeable odor and taste due to the impurities present. These impurities are acetone, methyl acetate, allyl alcohol, furfural, etc.

"Methyl alcohol is produced in the United States in grades varying from the denaturing wood spirit, containing 18 to 30 per cent acetone, with considerable

amounts of allyl alcohol and other impurities up to the best grade of acetone, free methyl alcohol, which is also practically water free. It finds use as a denaturant of ethyl alcohol—the lower grades as a complete denaturant and the so-called 'commercially pure' methyl alcohol (99%) in some of the special formulas (8*b*)."

It has been claimed that the impurities are responsible for the peculiar toxicity of wood alcohol and it has been even claimed that pure methyl alcohol is no more toxic than ethyl alcohol. However, several investigators (16, 17) have found very little difference between pure methyl alcohol and ordinary commercial samples.

It has also been claimed that the impurities present do not produce the characteristic effects. The impurities to which attention has principally been directed are furfural and acetone. The toxicity of furfural in acute poisoning, based on the lethal dose for rabbits, is about ten times as great as methyl alcohol (18). Acetone is more fatal than methyl alcohol in acute intoxication but not very much so (16). The presence of allyl alcohol has been ignored as it was thought to be present in too small amounts to be significant.

"The allyl alcohol content of crude wood spirit is 0.3 to 0.5 per cent. The wood spirit used for denaturing has a somewhat higher allyl alcohol content, the latter have been increased by the addition of those fractions from the refining which are high in allyl alcohol (8*c*)." The above quotation from Burghart was probably intended to apply to practices in England since the specifications of the Internal Revenue Department of this country give an upper limit for unsaturated compounds such as allyl alcohol permitted in wood alcohol used for denaturing purposes.

This alcohol CH_2: $CH.CH_2OH$ is a pungent liquid with a burning taste and mixes readily with alcohol, water and ether. Boiling point 96.6° C. Specific gravity, 0.8573 at 15/15° C. It is oxidized to acrolein and formic acid by dilute oxidizing agents. In dogs it was found that when given by mouth 0.05 cc. per Gm. of allyl alcohol in one per cent solution causes death in about seven hours. The toxicity based upon the lethal dose, is therefore about 150 times that of methyl alcohol. Allyl alcohol was found to be present to the extent of 0.5 per cent in one sample of wood alcohol obtained from the drug store and labeled chemically pure methyl alcohol.

The symptoms of allyl alcohol poisoning are similar to those commonly ascribed to wood alcohol especially the marked hyperemia of the gastric mucosa, intense vomiting, convulsive movements and coma. One animal receiving a sublethal dose developed in two days an opacity, apparently of the cornea, with blindness in one eye. This cleared up in two days more. Hunt describes similar optic symptoms in dogs given methyl alcohol. Upon subsequent histological examination he found the retinal cells degenerated.

The practical bearing of this is that some cases of so-called wood alcohol poisoning due to the use of this alcohol in illicit liquors as a substitute for ethyl or grain alcohol, may be due, in part at least, to the presence of allyl alcohol as an impurity in sufficient quantities to be significant.

Nine samples of seized liquors were examined for allyl alcohol and it was not found. This series is too small to be particularly significant especially since these samples complied with all of the official U. S. P. tests for whisky and may be considered as well-made preparations. Since it has been shown to be present in fermented liquors and also in wood alcohol, illicit liquors should be examined for

its presence. It has been shown to be highly toxic and even small quantities would materially increase the poisonous properties of liquors containing it. It is the only highly toxic substance definitely found present and should be investigated further.

COMMENT.

There are at least three classes of illicit liquors:

I. Properly made whisky and brandy.

II. Synthetic liquors.

III. Moonshine or home-brew liquors.

I.—The first class of liquors is in all respects the same as carefully made liquor of pre-prohibition days and has never been seriously suspected of containing toxic substance other than ethyl alcohol. Some of this is smuggled into the country and some obtained from domestic supplies in storage. Serious effects following the ingestion of this class of preparations is in all probability due as Hunt has suggested, to an over-dose of ethyl alcohol. Acute poisoning as a result of drinking bouts has long been known and is not surprising since the concentration of alcohol in the blood depends on the concentration of the alcohol in the liquor used and the rapidity of its ingestion. The margin between the concentration of alcohol in the blood required to produce intoxication and that causing collapse is not great.

II.—Synthetic preparations are made from alcohol and artificial flavors. The alcohol may be grain alcohol of good quality or it may be alcohol either from rectified denatured alcohol or from denatured alcohol which has not been made safer by rectification. Poisoning from synthetic liquors may therefore be due to any one of a large number of substances used as denaturing agents. Methyl alcohol is the substance which has been reported most frequently. Poisoning has also been reported from other denaturing agents such as nitrobenzene. These miscellaneous types of poisoning from denaturing agents are either rare or have escaped detection in many instances.

III.—The third class of liquors are those fermented and distilled surreptitiously and are known as "moonshine." Some of these are made under conditions comparable to legally made liquors and do not differ materially in composition from them. Others are fermented carelessly and are high in aldehydes as shown by Doran and Beyer. Although actual analyses are not available, there is reason to believe that the eagerness for profits result in incomplete fractional distillation with the inclusion of so-called "heads" and "tails." The former high in aldehydes, the latter high in "fusel oil." The evidence already reviewed would indicate that the poisonous property of moonshine liquors is not due to acetaldehyde which would be in the heads and that the quantity of fusel oil present is usually not great enough to increase the toxicity appreciably. The experiments of McNally and of MacNider show that the samples of moonshine used in their experiments were more toxic than an equivalent quantity of grain alcohol. The moonshine used by MacNider was distilled from fermented corn meal and molasses but not refined. His carefully controlled experiments under conditions which correspond to chronic poisoning, indicate that there is some undetermined substance present in his samples other than ethyl alcohol. It should be pointed out, however, that

these conclusions apply only to unrefined distillates prepared under his particular conditions which correspond to a poorly made moonshine.

A few cases of poisoning from lead derived from the still have occurred, but are probably rare. Poisoning from copper derived from the distilling apparatus is a remote possibility.

SUMMARY.

An examination of the evidence which from the nature of the problem is far from exact seems to prove that most cases of poisoning as a result of drinking bootleg liquor are due to the ingestion of an overdose of ethyl alcohol. The next most important constituent responsible for poisoning is methyl alcohol. A few cases of poisoning have been shown to be due to lead derived from the solder use in making the joints in the distilling apparatus. Poisoning from any one of the large number of denaturing agents is possible. Poisoning is also possible from poorly made liquors containing excessive amounts of "heads" and "tails." The results of MacNider show that the continual use of poorly made moonshine damages the kidneys of animals whose kidneys are not quite normal and also the kidneys of normal animals. This injury occurs even in the absence of acute symptoms. The particular chemical compound responsible for the damage has not been determined but the unsaturated alcohol related to acrolein and known as allyl alcohol is suspected.

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THE QUALITY OF COMPRESSED TABLETS, PARTICULARLY AS TO SOLUBILITY AND EASE OF DISINTEGRATION.*

BY WILLIAM J. HUSA.**

In judging the quality of a batch of compressed tablets there are a number of points to consider, *i. e.*, uniformity of appearance, uniformity of weight, uniformity and accuracy in amount of drug, purity of materials, absence of crumbling, chipping and discoloration, and solubility or property of disintegrating when dropped into water.

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The National Formulary (1) states that compressed tablets composed of insoluble medicaments should disintegrate within a few minutes when dropped into water. In throat tablets, where a continued local effect is sought, the tablets should disintegrate very slowly, while in hypodermic tablets very rapid solution is necessary. Obviously, a tablet which is swallowed must dissolve or disintegrate within a reasonable time if it is to have any medicinal effect; preferably, in most cases at least, it should readily be dissolved or disintegrated. A tablet that will pass through the alimentary tract without disintegrating is not only useless, it is worse than useless, for it not only fails to have the desired effect, but through the confidence wrongly placed in it, stands in the way of other treatment which might prove beneficial.

The solubility of a tablet depends, to a certain extent, on the solubility of its ingredients. In the case of insoluble substances, the treatment will differ according to whether or not the substance possesses a cellular structure. Vegetable powders, such as ground roots, barks, etc., gradually swell in water; this property assures disintegration of a tablet largely composed of material of this nature. For tablets of insoluble chemicals, something must be done to cause the tablet to disintegrate after it is swallowed. A very common method, of course, is to incorporate 15% or 20% of dry starch in the tablet; when the tablet comes in contact with water the starch swells, thus causing the tablet to break up. According to Scoville (2), such tablets must be kept in well-closed containers, or they will gradually absorb enough moisture to prevent disintegration. Another method is to incorporate a small amount of sodium bicarbonate and citric or tartaric acid in each tablet. When such a tablet is dropped into water, there is an effervescence and the tablet falls apart. Starch may also be used to advantage, in many cases, in the tablet coatings to prevent insolubility due to the coating. Excessive hardness of a tablet, the use of too much gum and the too liberal use of oil as a lubricant are factors which tend to hinder disintegration.

The above facts are well known to tablet makers and it might seem that there is little chance for any trouble due to insoluble tablets. However, Robert C. White (3) has stated that some coatings on the market render a tablet absolutely insoluble and therefore defeat the entire plan of medication. Other investigators (4) have also reported similar results. Henry J. Goeckel (5) has reported a case in which salol tablets passed through the alimentary canal unchanged.

Since tablets which will not dissolve or disintegrate are thus occasionally encountered, it seems to me that there is a chance for the retail pharmacist to do a real professional service by occasionally checking up on the tablets that he buys and dispenses. The simplest procedure is to drop the tablet into a vessel of water and note the result.

I recently made a test of this kind on tablets purchased from an ordinary drug-store stock. I obtained 20 samples of tablets, which included the products of 13 different manufacturers. The tablets were dropped into water at about 80° F. and the results were noted. Some kinds of tablets disintegrated in a few seconds, while two kinds were not disintegrated after two days.

In considering the results, it will be convenient to classify the tablets into groups. Of the synthetic organic chemical tablets tested, 5 kinds disintegrated in 15 seconds or less, one required about 1 minute and two required about 10 minutes.

Salol tablets (5 grain) did not disintegrate in 48 hours in either water or dilute sodium carbonate solution. One brand of barbital tablets disintegrated in 10 or 12 seconds, while another brand was not completely disintegrated in 10 minutes. Tests with iodine indicated that starch or dextrin was the disintegrator used for this group of tablets. The salol tablets contained starch, but for some reason this was not effective in bringing about disintegration.

Two brands of urotropin tablets were tested; these dissolved without disintegration within 10 minutes. Urotropin tablets are an example of tablets made from a soluble chemical, in which case no disintegrator is required. Tests with iodine indicated that starch and dextrin were absent in the tablets tested.

When tablets of calomel and rhubarb were dropped into water, surface disintegration began after 10 seconds; the tablets were about one-half disintegrated after 5 minutes and completely disintegrated in 25 minutes. A test with iodine indicated that starch and dextrin were absent. The tablet of calomel and rhubarb illustrates the class in which disintegration is brought about by the swelling or the vegetable drug present.

Tablets of whole ovary and thyroid tablets softened up and broke apart in about an hour. An old enzyme tablet which had been in stock for some years had not disintegrated when the experiment was discontinued after two days.

Tests were not made with coated tablets but from the references cited, it would be very desirable to make occasional tests of such products at the prescription counter. The pharmacist will thus be able to eliminate any tablets which were improperly made, or which have lost their power of disintegration while on the shelf. Traveling salesmen who extol the value of their tablets in general terms should be asked to demonstrate the disintegrating power of their tablets.

In regard to salol tablets, it is of interest to note that several years ago the Committee on diluents and excipients of the American Drug Manufacturers' Association (6) reported that the amount of excipient used varied greatly among the different makers. Thus data secured from 12 firms making five-grain salol tablets showed that the percentage of excipient calculated upon the weight of the salol varied from 18% to 65%. This state of affairs emphasizes the fact that compressed tablets have not been standardized by the U. S. P. and N. F. in the manner that other types of preparations such as fluidextracts have been standardized. No standard being set, each manufacturer must chart his own course and, accordingly, it is not difficult to understand why there is sometimes a great difference in the solubility of tablets made by the different manufacturers. In view of the great difference in amount of excipient used by different manufacturers, with resulting differences in the properties of the tablets, it is important that retail pharmacists should become more discriminating as to the quality of the tablets they purchase. The extra care exercised by the pharmacist will bring benefits to the patient, to the physician and to the pharmacist himself, as well as to those manufacturers who are producing superior products.

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COLLEGE OF PHARMACY,
UNIVERSITY OF FLORIDA,
GAINESVILLE, FLA.

THE DETERMINATION OF SUGAR, URIC ACID, UREA AND CREATININE IN ONE CUBIC CENTIMETER OF BLOOD.*

Byrd determines sugar in one drop of blood—this working with a small amount of blood prompted the writer to prepare this paper.

BY EDWARD S. ROSE.

This paper is written with the hope that it may be of interest to those pharmacies doing diagnostic work.

Much progress has been made in the chemical analysis of blood. Such workers as Folin, Benedict, Meyer, Wu, Van Slyke, Cullen, Marshall and others have given dependable methods for determining non-protein nitrogen, creatinine, creatin, urea, uric acid, sugar, chlorides, cholesterol, etc.

Of these many constituents in the blood probably the sugar content is the most important clinically to the average physician in his daily practice. Of the nitrogenous constituents probably the knowledge of the content of uric acid, urea and creatinine in the order named is of the greatest diagnostic value. Knowledge of the other constituents are of value to the physician at times.

Byrd (*J. Lab. Clin. Med.*, 11, 67–75 (1925)) has adapted the Folin-Wu method to the estimation of sugar in one drop of blood. This work suggested to the writer the possibility of determining the above-mentioned constituents in a small amount of blood as one cubic centimeter.

The materials used in the experimental work were solutions of varying proportions of dextrose, urea, uric acid and creatinine, and blood which for the most part was from the chicken.

The scheme of analysis follows that of Folin-Wu. One cubic centimeter of blood, measured in a pipette, is freed of protein in the prescribed manner. In order to obtain the maximum volume of filtrate the mixture is filtered with the aid of a filter pump. This filtrate is used in the following determinations:

Sugar is determined in one cubic centimeter of the filtrate by the Folin-Wu method using Folin-Wu sugar tubes. Prepare at least two tubes of standard sugar solution containing 0.1 and 0.2 mg. dextrose, using for comparison the one nearest the sample. Dilute all tubes to 25-cubic centimeters.

Uric Acid is determined in 2 cc. of the filtrate by the Folin-Wu method with slight modification. In order to match the colors better 1 cc. of the diluted uric acid standard solution is added to the sample and the proper correction made in the calculation. For the comparison at least two tubes containing 2 and 4 cc. of

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* Scientific Section, A. PH. A., St. Louis meeting, 1927.

the diluted uric acid standard solution representing respectively 0.008 and 0.016 mg. uric acid are prepared, and the nearest in color used. All tubes are brought to the same volume before adding reagents and finally to 25 cc. when compared.

Urea is determined in 2 cc. of the filtrate by following in a general way the Folin-Wu method. This determination is more difficult to carry out since interfering substances may be carried over in the distillation such as dextrose, creatinine and ammonia which may be present in the reagents. All distilled water for preparing reagents, diluting purposes, etc., is freed of NH_3 by redistillation with sodium bisulphate. To prevent the carrying over of interfering substances a short-neck 200-cc. pyrex distilling flask is substituted for the large test-tube directed by Folin. The suggested aerated distillation of Butka and Meisner (*J. Lab. Clin. Med.*, 10, 937 (1925)) is followed, only attaching to the inlet a flask of diluted H_2SO_4 to collect ammonia in the air.

Briefly the procedure is as follows: Two cc. of filtrate is placed in the distilling flask and a drop of phenol red T. S. added and a drop or so of $N/50$ NaOH to give a red color, then two drops of buffer solution and 1 cc. of recently prepared Folin urease solution. Stopper and place the flask in a water-bath for 5 to 8 minutes at 50–55° C. Remove flask and add 3 cc. saturated borax solution and 2 cc. of distilled water, connect to distilling apparatus and run into a test-tube containing 2 cc. $N/1$ HCl. Distil down to about 1 cc. Disconnect test-tube, wash aerating tube with a little distilled water, cool and add 2 cc. Nessler's solution and distilled water to make 25 cc. Prepare a standard for comparison by diluting 1 cc. of standard ammonium sulphate solution (0.283 Gm. in 1000 cc. distilled water) with 40 cc. distilled water, 4 cc. Nessler's solution and distilled water to make 50 cc. One cc. of this standard solution gives a color the equivalent of that produced by 0.002572 Gm. urea. Run a blank and make the proper correction.

Creatinine is determined by the use of picric acid and sodium hydroxide but since the procedure varies somewhat from the Folin-Wu method it is given below. Since the reagents give a yellow color there will be an error in comparing the sample with a standard of different depth of color, unless a correction is made. The coloring power, the equivalent in terms of creatinine, can be found by comparing two tubes containing different amounts of diluted creatinine solution, or with one of the tubes a blank. This the writer has found to be approximately 0.00015 mg. to the cc., which of course may vary with the reagents.

The procedure is as follows: Place 2 cc. of filtrate in a test-tube and in three others place 1, 2, 3 cc. of diluted standard creatinine solution (containing 1 mg. in 250 cc.), representing respectively 0.004, 0.008, 0.012 mg. creatinine. Add distilled water to make the volume of the tubes the same, then add 1 cc. of saturated picric acid solution and 1 cc. of 5 p. c. NaOH. Mix and allow to stand 10 minutes, dilute to 25 cc. with distilled water and compare with the nearest standard within 5 minutes. If the color of the tubes compared is of approximately the same depth, no correction need be made for the color due to reagents.

Remarks.—The results obtained were favorable. The error amounted to from 1 to 6 per cent, using known materials, being greatest usually in the urea determination.

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IOWA CITY, IOWA.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

HUMAN NATURE APPEALS WHICH ATTRACT ATTENTION TO DISPLAYS.

(*Continued from December* JOURNAL.)

A druggist once drew hundreds of curious people to his window when he pasted a huge sign on the glass which said in letters four feet high, "98 cents." An instinct is an inherited tendency, we all have to act the same way under the same conditions. To be sure, our instinctive acts are subject to modification, as the result of education and environment, but the fact remains that to keep from acting instinctively like other people conscious efforts must be made. The tendency to react instinctively is always there.

One of the most frequent instinctive reactions is the desire to get something for nothing. In the case of the window display just mentioned, the irresistible impulse of the people who passed was to look further at the display. Why? The figure, 98 cents, suggests a bargain—an opportunity to buy something for less than its usual price. What is to be bought isn't so important just at the moment as the fact that is telegraphed to the minds of passersby, "Here must be a bargain. Else, how could it be 98 cents?"

Then the instinct of curiosity also expresses itself. What is it that can be had for 98 cents? Thus one instinct helps another to bring attention to a display.

Another interesting use of the instinct of curiosity to draw attention to a display was made by a hardware merchant on the Pacific coast. He covered the inside of all of the glass of a display window with heavy, opaque wrapping paper. The only place a person could see the inside of the window was through a port-hole about 8 inches in diameter cut through the paper in the exact center of the front window. The curious could peer through this hole and see within a wondrous display of miniature electric railroads. The looker was sure to marvel at the display because while looking through this tiny port-hole his attention was certain to be fixed on nothing else but this display.

There are practical difficulties in the use of that kind of a display. It is perfectly apparent that only a small fraction of the people who normally would see the display could be accommodated one at a time in the same period by peering through the port-hole. I doubt if the added attention these few gave who did see

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the display was worth as much as a more casual survey which a great many more people would have given it if the window had been open.

As a matter of fact, the display had enough individuality and novelty to attract and hold attention on its own merits without resorting to this forced appeal to the instinct of curiosity.

There is a tendency to overestimate also the value of the bargain appeal in attracting attention to drug-store displays. A window full of patent medicines or cigars all at seemingly bargain prices has, many times, a wonderful pulling power. Don't forget, however, that an offer of a dollar article for 79 cents, while it is a cut of 21 per cent, only offers the customer the opportunity to save 21 pennies. True, most people are not averse to saving 21 pennies but they will not and cannot afford to go very far out of their way to make the saving. The time, effort, car fare and other expenses involved would be much greater than the possible saving.

On the other hand, a 21 per cent reduction on a living room chair selling originally for $100 is something to bring people long distances to buy because this is an opportunity to save not 21 pennies but $21. The furniture man has made no greater a price sacrifice proportionately than the druggist, but the drawing power of his offer is increased immeasurably because of the difference in the amount of the money that is involved in the individual sale.

Closely related to the bargain or something for nothing instinct is the acquisitive instinct—the desire to have things. That is one of the secrets of the success of free samples. People accept something they perhaps would not obtain otherwise and become interested in the purchase of a large size package as a result of the merits they find in the sample.

One very effective use of the acquisitive instinct—fortified by the something for nothing appeal was in the display of a shaving soap. The central figure was a life size photographic cut-out of a man with one hand outstretched toward the front of the window. In this hand he held a real sample of the shaving soap. Over his head a sign in large letters read, "Will you accept a free sample of —— shaving soap?"

The natural desire we all possess to have things, especially when they are desirable and free, was appealed to with great force in this picture. The natural impulse is to respond to such an appeal.

A huge picture of an attractive baby draws the attention of women and men passersby because of the love of children (the parental instinct) which we all possess in one degree or another.

There are many other instincts to which appeals may be directed in order to attract attention to a display. Among them are imitation, pride, self-preservation, comfort, play, beauty, cleanliness, competition, sociability, sex, hunger, hunting and construction.

In the use of any instinctive appeal, the principle is the same. Remember that an instinct is a tendency we all have to act in a particular way under the same conditions. Displays which attract attention on this basis, therefore, have in them a quality which should have an appeal to everybody.

This doesn't mean that 100 per cent of the people who pass a display which tries to attract attention because of its appeal to an instinct or a group of instincts will pause transfixed for minutes to study the display in all its details. There

are too many other things competing for their attention at the same time. Some of these other things may attract attention also by instinctive appeals. The instinctive appeals simply give a display a greater chance to succeed than it otherwise would have. This is because of the universal appeal of the instincts.

Emotions are mental states which tend to occur in every one under the same conditions. A group of people standing on a corner waiting for a street car scurry hastily for safety when a recklessly driven automobile bears down upon them. The instinct of self-preservation expresses itself in this pell mell rush to safety. At the same time, each one of these people has a feeling of fear. That is one way in which emotions express themselves—as accompaniments to various instincts. Sometimes, however, they may be expressed without any corresponding instinctive action. Emotions which can be employed effectively to attract attention to displays are joy, sorrow, sympathy and wonder. Some of the more negative emotions may be used also when appropriate; anger and disgust are examples.

People who like to think they are practical-minded often express doubt at the wisdom of spending the thousands of dollars which the large department stores pay every year for holiday decorations. They wonder how such decorations possibly can have selling value.

Shrewd merchants know, however, that these decorations attract thousands of people to their stores and give added drawing power to the windows decorated in the same spirit. Why?

Christmas, for instance, is universally observed as a holiday in the United States. The Christmas spirit has become a phrase signifying good cheer, good fellowship and generosity. It is hard to find a person in the United States who doesn't have at least some interest in Christmas. In children it is the magic interest for many weeks before and after the holiday.

The merchant who decorates his store and his merchandise in keeping with this wide-flung interest in Christmas, therefore, transfers immediately some of this Christmas spirit to his store and to the things he has to sell. People are interested in Christmas. His store and his merchandise express the spirit of Christmas. Therefore, people are interested in his store and his merchandise.

There are few stores indeed which take full advantage of this opportunity to transfer Christmas spirit and interests to their store and merchandise. It is not sufficient just to show a few items of Christmas merchandise or a box or two of candy in a holly wrapper. The whole store and the people in it must express the spirit of Christmas. To accomplish this, decorations have to be much more than a crepe paper bell at the door or a couple of sprigs of holly in the window. Streamers, garlands, wreaths, holly, greens, all heighten the appeal in the store to this widespread appeal of Christmas. The services of a skilled decorator familiar also with a store's merchandizing problems will be found particularly valuable.

I have spoken at length of the value to a store of making itself especially attractive at the Christmas season and that this result may be accomplished by decorations in harmony with the spirit of Christmas should be used. What is true of Christmas is true, of course, of the other holidays which may be observed in the store's community during the year.

In fact, a store may skilfully capitalize the interest which exists in any custom or tradition or object of great public interest in just the same way. It pays

to be magnanimous and generous in tying up with customs, traditions and other public interests, rather than to attempt any cheap and rather forced tie-up with store's own merchandise.

The druggists who have used "Pharmacy Week" windows know this. Those who have made a display designed primarily to show the professional nature of pharmacy have been uniformly complimented and have earned the respect and good-will of their patrons. Those who have made "Pharmacy Week" an excuse to conduct a cut-price drive on home remedies have produced this reaction among their patrons—"Oh, this Pharmacy Week is just another scheme to get our money away from us." Thus neither the store nor "Pharmacy Week" has profited.

(Another article in this series will appear in the next issue.)

TOO MANY DRUG STORES.*

BY WORTLEY F. RUDD.

I had the privilege of reading a paper on this subject before the Section on Education and Legislation a few years ago. Under the auspices of the Drug Trade Bureau of Public Information it was syndicated and rather widely published or commented on. All of the comments that I saw were favorable except one—that came from Philadelphia. At the time the paper was read Dr. Jacob Diner, somewhat in defense of the situation in New York City, said in concluding his discussion of the subject "So while the figures are interesting and some deductions may be drawn therefrom, they are not conclusive that there is an over-production of pharmacists or an over-production of drug stores." We agree, of course, that the truth or falsity of the statement contained in the subject is a matter of opinion. The writer's opinion is that there are at least twice as many drug stores as there should be, taking the country as a whole. He believes further that the organizations whose close coöperation can gradually decrease the number of stores, *viz.*, the Colleges of Pharmacy, the Examining Boards, the A. PH. A., the N. W. D. A. and the N. A. R. D., are not yet united in their acceptance of the principle that there are too many stores nor has any one of them really worked out a plan for decreasing the number even when they have assented to the policy itself.

From the most reliable information that I have been able to obtain on the subject, there is a net increase of about 500 stores per year in the country as a whole. On the 1924 basis of 2236 potential customers to a store on the average and an increase in population of the country of between one and two million a year, the new stores are actually raising this average slightly but too slowly to have any practical effect upon the situation.

Information has come to me recently that in one large city 62% of the retail pharmacists can buy goods only on a C. O. D. basis, in another 32% and in another 42%. Such an economic unsoundness must ultimately be a breeding ground for unethical and even irregular practices. Is it not our business to consider well such conditions? Is it not time for somebody in pharmacy to take action?

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* Read before Section on Commercial Interests, A. PH. A., St. Louis meeting, 1927.

I am bringing this subject before the section a second time with the hope that we may discuss it very thoroughly. It may be that such discussion will lead to the formulation of some motion embodying the composite judgment of the group on this important question. I believe we must act if we are to save the modicum of professional and economic integrity that is left us. I hope to see the section on Education and Legislation initiate some movement which will spread through the parent organization and eventually find its way into the other national pharmaceutical organizations to the end that the independent retail pharmacy may function as an economically sound and professionally efficient unit in public service.

ABSTRACT OF DISCUSSION.

Jacob Diner said that the author of the paper had quoted him correctly but had failed to state that his remarks relative to the number of drug stores in New York compared that number with those of the United States as a whole. The paper referred to was read in 1923 and since then an ownership law has been passed in New York. He maintained that education was one thing and ownership another; also that it was the duty of the university or college to offer every man and woman an opportunity for education. Limitation of students might interfere with prospective students who would develop into good pharmacists; after all, success depends largely on the individual. He agreed with the author of the paper that there were too many drug stores but he questioned whether a school had the right to refuse students the opportunity for an education in pharmacy.

John Culley contended that there were too many classes of people in business. He was of the opinion that personality and business ability draws trade and that the people will gravitate to the store which evidences the best business methods. He did not think anything worth while would be accomplished in cutting down the number of drug stores.

E. R. Serles referred to the experience of banking institutions in some sections of the country. He referred particularly to a community in which a large number of banks had been developed. The public at that time did not know there were too many banks, but they do now.

Robert P. Fischelis was of the opinion that the colleges shared in the responsibility to limit the number of those going into pharmacy. He implied that five hundred stores, each with a fully registered pharmacist in attendance at all times, would require, at least, one thousand graduates in pharmacy.

John Culley questioned whether any law relating to pharmacy provided for restriction of the number of drug stores by refusal to issue certificates, provided the applicants were entitled to them. There are some boards that confer with those who desire to go into business and as far as possible investigate the ability of the prospect in making a success of a business venture in the locality selected.

Robert P. Fischelis said that the New Jersey Board was not admitting more than one hundred to the examinations at one time.

C. Leonard O'Connell thought all applicants could demand an examination.

W. C. Anderson questioned the method referred to and stated that he desired to help Dean Rudd in his proposal, but thought that he had not offered a solution of the problem.

Dean Rudd replied that the way to reduce the number was to have a very few graduates.

W. C. Anderson thought it was impossible for educational institutions to refuse an education to applicants provided they had the necessary qualifications. In his opinion a graduate in pharmacy should be compelled to serve at least a year of apprenticeship in pharmacy and that this record should be carefully checked by the Board of Pharmacy before a full license is issued. He also suggested 2-, 3- and 4-year courses and that after completion of the first two years such applicants could serve as clerks but not operate pharmacies. Those who had completed the full four-year courses would be entitled to become proprietors.

He asked if there was any demand on the part of the public for a less number of pharmacists and expressed the belief that the process of elimination was now going on.

In every locality physicians are favoring certain pharmacies and the qualification of pharmacists is thereby aiding in the elimination. In some stores a large number of prescriptions are

filled and in others only a very few. He also referred to the fact that a certain percentage of college of pharmacy graduates entered other fields of activity.

C. B. Jordan said that there were too many graduates in pharmacy and too many colleges of pharmacy. In Indiana there are four colleges of pharmacy and these have been in operation for a long time and he considered this a problem and as important as too many graduates. He thought that the resolution should be passed by the Section holding that there are too many drug stores and he would be glad to make such motion.

The motion was seconded by **Edward Spease.**

A. R. Bliss asked whether it would be possible to refuse a taxpayer entrance to a school of pharmacy provided his qualifications were otherwise up to the requirements.

Robert P. Fischelis remarked that the rules of the New Jersey Board were based on the fact that five examiners cannot conscientiously examine more than one hundred applicants at one time.

E. R. Serles said that he was not fully convinced that we have too many drug stores. Such a situation might obtain in certain localities. He did, however, concur in every effort to raise the standards of pharmacy.

Jacob Diner considered the ideas of Professors Jordan and Rudd good, but he did not think the wording of the motion covered the ground.

W. C. Anderson stated that the motion could be changed in effect to discourage the unnecessary opening of drug stores. Dean Jordan agreed with this charge.

Edward Spease held that this was a good idea embodied in the statement made by Dr. Fischelis and he thought the plan of limiting the number of candidates before State Boards advisable.

R. J. B. Stanbury, Secretary of the Canadian Pharmaceutical Association, said that he had just come from a meeting of that organization where a somewhat similar discussion had taken place. A great many druggists protested against the limitation and also the requirement for having a registered man in charge *at all times.* He agreed with Dr. Diner that it may be questioned whether an institution has the right to refuse an education to an individual provided he meets the requirements of the institution. In Nova Scotia provision has been made for registering applicants who have not completed the full college course, but such men cannot become proprietors.

The following resolutions bearing on the discussion were adopted at the convention of the AMERICAN PHARMACEUTICAL ASSOCIATION in St. Louis:

On Opening New Drug Stores.

WHEREAS, an outstanding menace confronting retail druggists to-day is the ever-increasing multiplicity of new stores,

WHEREAS, this condition is due in a large measure to a desire on the part of students in pharmacy to embark in business immediately upon graduation,

Resolved: That college professors, wholesale druggists, manufacturing pharmacists and others with influence urge said prospective retail druggists to acquire stores already established.

On Number of Drug Stores Dependent upon Need for Service.

WHEREAS, the security, well being and health of the community depends, to a large extent, upon the proper type of professional pharmaceutical service, and whereas the proper type of professional pharmaceutical service is determined by the professional personnel, the general fitness and equipment of the pharmacists themselves and the degree of public support received, therefore be it

Resolved by the AMERICAN PHARMACEUTICAL ASSOCIATION, in its traditional purpose of fostering and developing the highest type of pharmaceutical service, that all persons desirous of opening new stores be earnestly urged to study the needs of communities and to refrain from opening new stores in neighborhoods that are being adequately and properly served in this important matter.

MEDICAL COLLEGE OF VA.,
RICHMOND, VA.

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

A. C. Taylor, President, Washington, D. C. J. W. Gayle, Treasurer, Frankfort, Ky. Lucius L. Walton, Chairman of Executive Committee, Williamsport, Pa. H. C. Christensen, Secretary, 130 N. Wells St., Chicago, Ill.

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Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming
Indiana	Montana	Rhode Island	

SKILL ONLY REASON FOR SALES RESTRICTION.

In reviewing the Minnesota Supreme Court Aspirin decision,[1] Editor Clayton of the Rocky Mountain Druggist, who is Secretary of the Colorado Board of Pharmacy as well as the Colorado State Association, makes some very timely and pertinent comments. He calls to attention the fact that although the court stated in its decision that no special skill is required to *sell* aspirin, the inference is that the pharmacist due to his training is able to *select* and *procure* a good quality. Thus, the public is protected by limiting the sale to persons who can discriminate as to quality. Only such a reason could warrant restriction of sales to pharmacists.

Quoting Mr. Clayton, "Not long since, the writer was arguing along this line with an opponent of the then pending pharmacy amendments in the Colorado legislature, and in the course of the argument, cited an instance in which he had seen in a general store a display of castor oil, syrup of ipecac, spirit of nitrous ether and other similar articles in a south window, unprotected from the blazing sun. He was somewhat taken aback, however, when his antagonist in turn cited conditions in some drug stores, referring particularly to the storage of volatile oils on a balcony directly over a radiator, where they were subjected to the deteriorating action of the heat. And the writer himself has seen efflorescent salts, such as copperas and blue vitriol, stacked up on a hot radiator, Epsom salts and similar articles in open boxes, exposed to dust, flax seed in damp places where the growth of mould occurred, and many other such abuses."

"Now, if pharmacists are to continue to be entrusted with the exclusive handling of drugs," continues Mr. Clayton, "they must be deserving of the privilege."

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[1] See N. A. B. P. Department A. PH. A. JOURNAL, August 1927.

PERSONAL AND OTHER NEWS.

A picture of the **Alabama Board** "in session" published in the December Southern Pharmaceutical Journal shows the members in outing togs with thirteen great big fish draped gracefully around them. Thirteen seems to be their lucky number. Who made the catch is a secret, but as Hal Duncan has the fishing rod and the other members hold the fish, we leave it to your imagination to guess.

The **Michigan Board of Pharmacy** has recently published a compilation of the pharmacy and drug laws of that State, with rules and regulations for their enforcement. The booklet is comprehensively indexed, making the information very accessible. One chapter gives all the State and federal laws pertaining to prohibition; another, Supreme Court decisions relative to the constitutionality of the pharmacy laws; the third, Attorney General's department's opinions. With this pamphlet in the hands of every pharmacist in the State, there is no excuse for ignorance of the law. The effectiveness of any board's work can be greatly increased by following this excellent example.

The board's annual report is included in the booklet and shows thirty pharmacists accepted by reciprocity during the year and twenty-eight leaving the State in the same manner, during that period. There are 2375 licensed drug stores in the State. The inspections for the year numbered 2517; 41 convictions were obtained on 44 violation warrants issued. Out of 968 candidates taking examination during the year, 495 passed.

Our own genial Treasurer **J. W. Gayle** surprised the N. A. B. P. office with a visit on Armistice Day. From our office windows, he watched paper streamers and adding machine tape gyrating through the air, confetti clouds descending and waste paper falling to the streets. Chicago was celebrating. To add a solemn note to the occasion, taps was sounded by ex-soldiers from the elevated platform in plain view of the office windows.

After a pleasant visit with a daughter who recently returned to Chicago from Russia, Mr. Gayle left for his home in Frankfort, Ky.

The Attorney-General of the State of Georgia recently issued a ruling to the effect that under the pharmacy law passed by the Georgia Legislature in August 1927, any person having three years of practical experience previous to passage of said act, irrespective of age or educational qualifications, shall be entitled to take examination before the Georgia Board of Pharmacy for license as pharmacist.

From the time of the act becoming in force, applicants for examination as registered pharmacist must be not less than 21 years of age and shall have at least a high school education and not less than three years of drug-store experience; provided, however, a graduate from a recognized school or college of pharmacy may, in lieu of experience, be entitled to take such examination.

This new law apparently nullifies the ruling of the Georgia Board of Pharmacy, which became effective July 1, 1927, requiring college graduation for entrance to examination for registered pharmacist.

The provisions of the new law put Georgia entirely out of line with other States in that the candidates who register in that State under the requirements of the law cannot qualify for reciprocal registration in any State which requires four years of practical experience for entrance to examination, or which requires graduation from a recognized school or college of pharmacy, crediting time spent in college on the four years of required experience.

It is exceedingly unfortunate for Georgia and Georgia pharmacists that a law so obviously out of harmony with the laws of other States in its requirements for registration as pharmacist has been enacted by that State.

Alexander Reid of Detroit, a member of the Michigan Board, is Secretary-Treasurer of the Reid-Houser Drug Co., a new organization which operates six high class stores and is expecting to open the seventh soon. The N. A. B. P. wishes Mr. Reid success in his new venture.

John Culley champions the metric system. In a speech made before the Kiwanis Club

of Ogden, Utah, he advocated its adoption and said that by doing so, the equivalent of one entire year of school work would be eliminated for students. He added that fifty-five out of fifty-seven civilized countries now use the metric system—England and the United States being the exceptions. "The avoirdupois and troy systems," Mr. Culley said, "are like Topsy, they 'just grew,' while the metric system was born after years of scientific investigation and research."

"An English king said 'An inch shall be the length of my thumb joint,' and the length of his thumb joint is still an inch," the speaker continued. "Before that it was as wide as three grains of corn side by side. A foot was the length of a certain king's foot, a furlong was the distance an ox could pull a plow through a field without becoming tired and a mile was the distance a Roman soldier could cover in 1000 double paces."

Mr. Culley then elaborated on the simplicity of the metric system and closed with the statement that it is high time for the United States to be numbered among the metric measuring nations.

E. H. Riske, Secretary of the Missouri Board of Pharmacy, recently took over the interest of his partner in the Riske-Tilgner drug store at Independence, and is now the sole owner.

STATE BOARD NEWS ITEMS.

Alabama.—Beginning January 1, 1928, W. S. Hunt, a druggist of seventeen years' experience, will be State drug store and narcotic inspector. This position was made possible by act of the last legislature. "It is a big step forward for pharmacy in Alabama," says Secretary Bingham.

Arizona.—Twenty-two of the fifty-five candidates writing the November examination were successful in passing and have been granted licenses as registered pharmacists.

Secretary Hulett reports that about ten new drug stores have been opened in Arizona during 1927.

Delaware.—At the October examination of this Board, six candidates were examined for pharmacist and six for assistant, three being successful and receiving the pharmacist license and four the assistant license.

The following officers were reëlected: *President,* Thomas H. Cappeau; *Vice-President,* R. M. Kaufman; *Secretary-Treasurer,* John O. Bosley.

Georgia.—The Board examined eighty-nine applicants during the December examinations. Of this number, thirty-two passed, six receiving the apothecary license and twenty-six receiving the druggist license. The next meeting will be held in Atlanta on May 16 and 17, 1928.

Indiana.—The Board announces that drug store permits for 1928 should now be renewed.

Reciprocal registration was granted on December 14th to John Elmer Feighner, of Michigan.

Iowa.—Of the twenty-eight candidates who wrote the examination held on November 9th and 10th, six were successful in passing.

Kansas.—Nine out of the sixteen taking the November full registered examination and seventeen out of twenty taking the assistant examination were successful in passing. The percentage of those passing is higher than usual and the Board members praised the work of the class.

The next meeting will be held in Wichita, Kansas, the first Wednesday and Thursday in February.

Louisiana.—The Secretary of the Louisiana Department of Public Welfare recently explained that under the new uniform licensure law of that State, the following can no longer be sold by unlicensed persons in Louisiana: Aspirin, boric acid, bay rum, castor oil, spirit of camphor, epsom salt, glycerin, hydrogen peroxide, sodium bicarbonate, zinc stearate. The uniform licensure law defines drugs and medicines as including all substances and preparations for internal and external use recognized in the U. S. P. or N. F., and the Secretary therefore interprets the law to mean that the foregoing items can be handled only by registered pharmacists.

Massachusetts.—The State Board of Pharmacy has again taken steps to have a college prerequisite law enacted in Massachusetts. The Board believes that if the law is passed, the public will be benefited by receiving improved service and the pharmacist by the reduction of the number of drug stores.

Michigan.—J. C. Dykema was recently elected President of the Board. This is the second time that Mr. Dykema has served the Board as presiding officer. He is the proprietor of a Grand Rapids professional pharmacy—over ninety per cent of his business consists of prescriptions.

Minnesota.—The Board has been very busy enforcing the recent aspirin ruling. Letters were sent out to the various associations—grocers, tobacco dealers, hardware, etc.,—calling attention to the Supreme Court decision that aspirin can only be sold by registered pharmacists. Ten convictions have been obtained under the ruling.

Montana.—As a result of the October examination, the names of seven pharmacists have been added to the records.

Leslie F. Gabert of South Dakota, Eugene F. Sullivan of Nevada, Harry A. Ames of Minnesota and Seth A. Welch of North Dakota were registered by reciprocity.

North Carolina.—Secretary Hancock reports that thirteen applicants passed the Board examination held at Chapel Hill November 22nd–23rd and have received licenses as pharmacist.

He adds that since the close of the fiscal year June 1, 1927, twenty-three registrants have been accepted by reciprocity.

Pennsylvania.—L. L. Walton, of the Pennsylvania Board of Pharmacy, writes of the second important Court victory relative to the Pennsylvania Ownership Law. The Liggett Company filed an injunction to restrain the Board of Pharmacy from enforcing the law on the ground that it is unconstitutional; the federal court in Philadelphia upheld the constitutionality of the act.

"Briefly, the Court said that to declare the law unconstitutional, it would need to find the act not in the public interest. On that ground only could it refuse to sustain it. It did not so find, and placed the costs on the Liggett Company. This should settle all questions of constitutionality which may be raised in other suits brought under this law."

Rhode Island.—Fourteen of the twenty-three applicants taking the December examination passed and have been granted licenses.

South Dakota.—The Supreme Court of South Dakota recently decided that the sale of patent medicines could not be restricted to registered pharmacists, although the Court held that the regulation of the practice of pharmacy is a legitimate exercise of police power. The court adds regarding patent medicines, however, "Nothing is gained by the restriction of such sale to pharmacists if they are in no way required to exercise any knowledge or skill or to protect the public in any way by refusing to sell where harm will result."

Tennessee.—A bill to raise the requirements for operating pharmacies will be introduced at the next session of the legislature, according to the plans of the Board. An endeavor will be made to make Tennessee's requirements equivalent to those of other prerequisite States.

Texas.—The Texas Board of Pharmacy will meet in the St. Anthony Hotel in San Antonio January 17, 1928. The midwinter meeting of the board has been held in San Antonio for many years. Several meetings of N. A. B. P. District No. 6 have in the past been held jointly with Board meetings at San Antonio where palms wave and flowers bloom all winter. The Texas Board is always glad when District 6 selects San Antonio for its meeting place.

On the second night of the meeting, January 18th, the annual banquet of the San Antonio Retail Druggists' Association will be held. This is a gala occasion given by the largest local druggists' association in the State. George Keene, veteran entertainment chairman, will have charge of the banquet and dinner dance. The January meeting of the Board has come to be a reunion between the members of the Board and the druggists of San Antonio.

Indications now are that from 125 to 150 applicants will take the examination. Among the applications now on file are a number from graduate pharmacists of Old Mexico, and these will be handled by Ed S. Russell of Laredo who speaks and writes the language of Latin America like a native.

Utah.—Twenty candidates took the October examinations in Salt Lake City and ten of this number were successful in passing.

Wisconsin.—The Attorney General's office recently gave G. V. Kradwell, President of the Board of Pharmacy, the opinion that department and general stores are not permitted, under the Wisconsin law, to sell U. S. P. or N. F. preparations unless a registered pharmacist is in charge. The opinion particularly affects the sale of aspirin. Merchants whose stores are three or more miles distant from a registered pharmacist are exempted, and such stores will be granted a permit by the State Board of Pharmacy allowing them to make such sales.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

HOW "THE THREE-YEAR MINIMUM" SAVED TO THE STUDENTS ONE-THIRD MORE CLOCK HOURS FOR USE IN THE PHARMACY LABORATORY.

BY D. H. SPENCER.*

The faculty of every college of pharmacy has had to solve the question: "What will the Three-Year Course include?" We have had Two-Year and Four-Year Courses for a number of years, but the intermediate, Three-Year Course, was a new adventure, and we were confronted with a new problem. Professor Spencer has shown, very nicely, how a combination of several courses into one longer course will be more economical of the student's time. There will be less repetition and, therefore, the time may be shortened.

Prof. Spencer does not tell us what is being done with the time that was saved to the student. I hope it is being spent on the fundamental general subjects such as English, history, mathematics, economics, etc., because our graduates from the shorter courses have always been handicapped on account of their courses being too technical. *The time has come for Pharmacy* to expand to include a more general training along with professional training.

C. B. JORDAN, Editor.

The University of Kansas, in revising its curricula preparatory to dropping the two-year course in Pharmacy, saved thirty-three and one-third per cent clock hours for use in the pharmacy laboratory. Three courses made up of lecture, recitation and laboratory work, and containing ten and one-half clock hours per week in the laboratory were so remodeled as to give the student fifteen hours per week in the laboratory without taking any more of the student's time for all the work than before. Perhaps similar improvements have occurred at other schools and comparing notes might be mutually beneficial.

For a good many years we have offered three courses in Pharmacy leading to degrees: a two-year course, granting a Ph.G., a three-year course, a Ph.C.; and a four-year course leading to a B.S. At the beginning very little was taught from the NATIONAL FORMULARY. (It was simply used as a reference book in the two-year course.)

We had a two-hour course called "Official Pharmacy" which was a study of the classes in both the U. S. P. and N. F., and the names of the U. S. P. preparations. We taught definitions of classes, number of preparations in each class, general methods or preparations, advantages of each class, general method of administration and preservation.

Another course offered was "Manufacturing Pharmacy," a study of the U. S. P. preparations in detail. It was a four-hour course: two-hours lecture and recitation and two-hours laboratory with the necessary laboratory instruction. When I say two hours, I mean two credit hours. In the laboratory, every credit hour requires three clock hours. Naturally we did not make all of the U. S. P. preparations but covered most of the classes, making types of each.

* Associate Professor of Pharmacy, University of Kansas.

As the National Formulary came more and more into use and the State Boards of Pharmacy commenced asking questions from it, we expanded the Official Pharmacy to include the names of the N. F. preparations and also posology, making it a three-hour course. At the same time we added to our curricula a three-hour course in manufacturing National Formulary preparations.

Like the U. S. P. manufacturing, this was half lecture and half laboratory work. The two-year curriculum was already full and it contained nothing that it seemed advisable to omit in order to admit National Formulary manufacturing. The expansion of Official Pharmacy from two to three hours had already added an extra hour to the course. So National Formulary manufacturing was not offered in the two-year course but was required of three- and four-year students in the third year and U. S. P. manufacturing of all students in the second year.

When the two-year course was dropped, these three courses: Official (3 hrs.), U. S. P. Manufacturing (4 hrs.) and N. F. Manufacturing (3 hrs.)—a total of ten hours, were reorganized into two five-hour courses: Theoretical Pharmacy—a lecture course and Practical Pharmacy—a laboratory course.

The six and one-half hour lectures, given in the three different courses, when organized into one course, it was found, could easily be covered in five hours, thus saving one and one-half hours or four and one-half clock hours for new work in the laboratory. This was easily possible because the same material given in different courses would necessarily take more time because of certain repetitions used in correlating matter and reviewing things learned the year before and forgotten.

There was also a saving of time by the elimination of repetition in manufacture of some U. S. P. preparations. It has always been our policy to have our students make as many of the preparations, used in making the preparations in the course, as practicable. As for example: In making Tincture of Ferric Chloride instead of furnishing the solution of ferric chloride, we had the students make it. This caused no extra work in U. S. P. manufacturing because all preparations used in making U. S. P. preparations had to be U. S. P. standard and could be included in the course.

But in the N. F. it was different. Here the material used might be either U. S. P. or N. F. For example: In making boroglycerine suppositories, glycerinated gelatin and glycerite of boroglycerine, which had been made the year before in U. S. P. work for credit, had to be made again in order to make the suppositories.

So that, without any extra time on his part, each student is given four and one-half extra clock hours in the laboratory which has been saved by a better correlation of the lecture material, and almost as many more by being able to use, in making N. F. preparations, U. S. P. preparations made in the course.

CITED FOR GALLANTRY IN ACTION IN NICARAGUA.

Lieut. William T. Minnick, Naval Corps, and three pharmacists' mates were cited for gallantry in action when U. S. Marines and Nicaraguan national guardsmen captured Quilali, Sandino's headquarters. The names of the pharmacists' mates are: Welder C. Caie, George B. Worthington and Harry A. Roonev. Lieutenant Minnick was in charge of the U. S. Naval Hospital Corpsmen Training School of the Philadelphia College of Pharmacy, during the World War.

THE PHARMACIST AND THE LAW

HOWARD KIRK,* EDITOR OF THIS DEPARTMENT.

Your new Law Editor makes his bow. He does not know whether Law Editor is his title, or whether he has any title. In fact, he does not know exactly what his job is. His letter of instructions requires him "to contribute articles which relate to specific law points which the druggists could not get elsewhere without considerable research." He will try to be as abstruse as possible.

* * * * *

The first title in the law books relates to the Name of the Druggist. It might be of interest to know that the Druggist and the Pharmacist are quite different personalities. The druggist, says a Massachusetts case, is a "person who deals in drugs and medicines." Dr. Webster calls him "one whose occupation is to buy and sell drugs, without compounding or preparation." The Pharmacist ranks higher. He, according to State Board of Pharmacy *vs.* White, a Kentucky case, "is a person who possesses the knowledge and skill necessary to compound and dispense medicines." The Apothecary, who has the most ancient title to his name, is defined as "one who prepares and sells drugs for medicinal purposes." And highest of all comes the Pharmaceutical Chemist, whose repertoire, in addition to that of the pharmacist, includes "the ability to analyze drugs and medicines and detect any adulteration."

* * * * *

The first effort is the hardest. Now that we are acquainted, we will proceed with the first person plural.

* * * * *

The other day we spoke to a member of the Pennsylvania Legislature that passed the 1927 Drug Store Ownership Law. This is about as drastic a statute on this subject as has ever been enacted. It requires that every pharmacy in the State shall be owned only by "a licensed pharmacist, and no corporation, association or co-partnership shall own a pharmacy unless all the partners or members thereof are licensed pharmacists," with certain exceptions in favor of firms and corporations already doing business. The Member from Philadelphia wanted to know how we liked the law. Our reply was that it was pretty hard on a corporation or partnership that came within the proscribed class, as its landlord could raise the rent *ad infinitum*, and the concern had no alternative but to submit or go out of business. The Member denied the fact; and we pointed out the provision in the Act that "no other or additional pharmacies or drug stores shall be established, owned or conducted by such corporations, associations or co-partnerships, unless all the members or partners thereof are registered pharmacists."

* * * * *

The Member argued that the term "additional pharmacies or drug stores" referred to the *business*, not to the particular place where the business was conducted. Then, reasoned we, why the Act? It would be easy to secure assignments of existing pharmacies, much as title in saloons was assigned to repre-

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sentatives of the various brewing interests before Prohibition. The argument closed as most arguments do—nowhere. Our Supreme Court will have to decide the matter. When it does, due and timely notice herein will be given.

* * * * *

We tried a new one on our class the other day. It is here offered for contemplation:

"I walk into a drug store and order an ice cream soda. The proprietor makes one up and hands it to me, and I finish it. Ordinarily it would cost 15c. I ask the price, and proprietor says 'One dollar, please,' I demur, and he points to a large sign directly in front of him, which reads 'All Ice Cream Sodas, One Dollar.' I had not seen the sign, but it was large enough to be easily read from all points in the store. Question: What should I do? What are my rights and what are the proprietor's rights?"

* * * * *

Solutions please. The line forms on the left.

* * * * *

And also suggestions. Your Law Editor is doing his best, but he does not know whether he has spoken his piece right or not.

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PHARMACY EXAMINATION ONE HUNDRED YEARS AGO.*

BY OTTO RAUBENHEIMER.

In connection with the Centenary of *The American Journal of Pharmacy*, I published a paper in its December number, JOURNAL A. PH. A., pp. 846 to 849, (1925), entitled "In 1825," in which I briefly mentioned under Events Pharmaceutical: "Law of December 1, 1825, regulates the final pharmacy examination in Prussia."

It is the object of my present paper to present details of this law in the making of which Sigismund Friedrich Hermbstaedt (1758–1833) exercised his influence. Since the demise of the celebrated Apotheker Martin Heinrich Klaproth (1743–1817), the father of mineral chemistry and analysis, Hermbstaedt became his successor as professor of chemistry and pharmacy at the University of Berlin and at the Academy of Sciences.

The pharmaceutical examination at that time was called "Pharmazeutischer Kursus" and the candidates were named "Pharmazeutische Kursisten." The examination fee was "20 Taler in gold less 8 Groschen." The practical examination was held in the Hofapotheke (Court Pharmacy).

The examination consisted of the following subjects:

1. Latin Examination.—The candidate was required to translate several monographs in the "Pharmacopœia Borussica," not only verbatim but according to the rules in grammar so as to leave no doubt as to his thorough knowledge of Latin. If the Latin examination was satisfactory the candidate would proceed to

2. Written Examination.—From three different jars he would draw one number each for the examination in the following subjects:

a. Pharmaceutical Chemistry

*Read before Section on Education and Legislation, A. PH. A., Philadelphia meeting.

b. Botany

c. Forensic Chemistry.

Those papers were to be answered in writing under the supervision of an examiner. Then followed,

3. Practical Examination.—According to the same system of drawing numbers the candidate was required to prepare

a. One chemical

b. Two prescriptions

c. Three galenicals.

The final part of the examination consisted of

4. Oral Examination.

a. Ten plants to be identified and described

b. Several drugs to state name, botanical origin, adulteration, examination, uses, etc.

c. several chemical preparations to state title, constituents or ingredients, preparation, etc.

Such was the pharmaceutical examination in Prussia one hundred years ago. Surely something to look up to, surely an examination which may still serve as a standard and ideal for Boards of Pharmacy of many States, including the United States in 1926. Another example of the "good old times."

This examination remained in force in Prussia and Germany until 1904 having been amplified by an order of November 13, 1895, which required additional separate examinations in Physics, Chemistry, Botany and Pharmaceutical Jurisprudence. Upon the recommendation of Hermbstaedt and Rose a herbarium and a collection of drugs and chemicals in glass jars were procured to be used in this examination. An order of the Minister, dated May 2, 1826, addressed to the Court Physician Dr. Hufeland, states that the instruments and apparatus needed in this pharmaceutical examination, such as balances, silver and platinum dishes, specific gravity apparatus, electrophone, eudiometer, etc., must be stored in a separate closet in the "Hofapotheke."

Christian Wilhelm Hufeland (1762–1836) was one of the great philanthropic physicians of that time, a true friend of the human race. He compiled the "Pharmacopœia Pauperum" in Berlin in 1810 which still exists to-day, in a somewhat modified form, as Formulae Magistrales Berolinensis (F. M. B.). His name continues to live in the "Pulvis Infantium Hufelandii" originated by him.

For the use of the candidates a library was established. This, however, did not seem to be used or appreciated as by order of April 19, 1833, it was again sold. Sorry to say the young pharmacists one hundred years ago did not seem to be "bookworms" and neither are they at the present time.

As to the number of candidates the meager records show that up to the end of 1826 twenty-three were examined and from January 1 to April 30, 1827, this number increased to thirty-nine. Evidently the profession of pharmacy one hundred years ago was not over-crowded, as it is to-day.

Besides being of historical value, this paper should also be of interest to the Section of Education and Legislation and quite especially its joint session with the Faculties and Boards of Pharmacy, to which I take pleasure in presenting it.

"Experientia est optima rerum magistra."

THE QUOTA OF PHARMACOLOGY AND THERAPEUTICS IN THE MEDICAL CURRICULUM.*

BY R. T. LAKEY.[1]

My objective in planning this paper was to determine whether the apparently lessened interest in prescription writing among recent medical graduates is due to a lack of confidence in the pharmacist or to some other cause. The following questionnaire was sent to the class "A" medical schools of the United States and Canada:

QUESTIONNAIRE.

In your under-graduate medical, "M.D.," course how many actual hours of instruction are given to the following subjects:

	Lecture	Laboratory
Pharmacology		
Therapeutics		
Remarks		

Signed by.....
School.....

Sixty-two per cent of the recipients answered. The geographical range of those answering is complete enough to give us a true picture of the general conditions which prevail relative to the allotment given to pharmacology, materia medica, pharmacy and therapeutics in the undergraduate medical curriculum of to-day.

The American Association of Medical Colleges has summarized the minimum requirements for an "M.D." course as follows:

CHART NO. 1.

The requirements for admission to and graduation from colleges holding membership in this association are 15 units of high school work and two years (60 semester hours) of college work.

The entire course of four years shall consist of not less than 3600 hours, and shall be grouped in divisions and subdivided into subjects, each division to be allotted approximately the time on a percentage basis, as shown in the following schedule:

1.	Anatomy, including embryology and histology	14–18.5%
2.	Physiology	4.5–6%
3.	Biochemistry	3.5–4.5%
4.	Pathology, bacteriology and immunology	10–13%
5.	Pharmacology	4–5%
6.	Hygiene and sanitation	3–4%
7.	General medicine (neurology and psychiatry, pediatrics, dermatology and syphilis)	20–26.5%
8.	General surgery (orthopedic surgery, urology, ophthalmology, otolaryngology, roentgenology)	13–17.5%
9.	Obstetrics and gynecology	4–5%
		76–100%
	Electives	24–0%

* Read before Section on Education and Legislation, A. PH. A., Philadelphia meeting.

[1] Director School of Pharmacy, College of the City of Detroit.

CHART NO. 2.

Medical school no.	Pharmacology. Total hrs.	Lect.	Lab.	Therapeutics. Total hrs.	Lect.	Lab.	Supplementary Subjects. Mat. Med. Lect.	Mat. Med. Lab.	Pharmacy Lect.	Pharmacy Lab.	Toxicology.
1	66			11 elective							
2	96	30	66	11 also have clinical clerkships							
3	104										
4	108	36	72	120							
5	108	36	72	72							
6	110			40.5				72			
7	112			16			48	44			
8	120	48	72	36							
9	120	30	90	85	50	35		78			
10	120	32	96	64							
11	132	66	66	22							
12	135	45	90	Included in medicine							
13	135	55	90								
14	135	60	75	30 also clinical ward studies							
15	144			64				48	48		
16	144	48	96	32				32	16		
17	144	56	88	32							
18	150										
19	150	75	75	60							
20	150	90	60	60							
21	156	64	92	96							
22	165	99	66	This includes therapeutics, etc.							
23	174	58	116	This includes therapeutics, etc.							
24	180	74	106	32							
25	180	90	90		45	60					
26	187	88	99	99							
27	187	85	102	68							
28	189	108	81								
29	190	110	80	33							
30	192	112	80	84			192				36
31	192	112	80	64							16
32	192	64	128	32 Therapeutical laboratory, part of clinical medicine							
33	195	120	75	60							15
34	198	66	132	24							
35	203	130	73	66	33	33					10
36	208	128	80								40
37	208	112	96	This includes therapeutics, etc.							
38	233	133	100							33	44
39	242			This includes therapeutics, etc.							
40	272	112	160	32							

Chart No. II was arranged from the answers to the questionnaire.

Examining the schedule, I believe you will be astonished at the lack of uniformity and the great variation in standards herein revealed. The courses in pharmacology in some schools are not separated into lecture and laboratory classes; therefore, only totals are recorded.

The number of *lecture hours* given to this branch, pharmacology, range from 30 to 133; laboratory hours from 60 to 192. The same lack of agreement is discovered in therapeutics; the variation in this case is in lecture hours from 11, all elective, to 16 hours required, to 120 hours.

The chart shows that some colleges teach materia medica and pharmacy in addition to therapeutics, pharmaco-dynamics, etc. Those of this group giving the most hours of instruction in these supplementary courses total materia medica 48, pharmacy, 48; another, materia medica, 192, pharmacy, 36. In justice to the colleges showing a small amount of required work in the branches covered by the questionnaire, it can be said in some cases they offered explanations to the effect that these branches are incorporated into their clinical instruction and an attempt thereby is made to train the student. It is needless to state that such an arrangement is poor pedagogy and cannot successfully supplant organized and systematic class instruction in the general principles involved.

After carefully examining Charts Nos. I and II, and analyzing the figures, I am inclined to believe you will agree with me that one of the principal reasons for the decline of prescription writing for U. S. P. and N. F. preparations, as well as the successful exploitation of the physician by the proprietary medicine manufacturer, is due to the unequal distribution of subject material and the improper emphasis placed upon the laboratory and surgical parts of the modern medical course in contrast with the attention given to the medical side.

It is evident that the primary function of undergraduate instruction in medicine is to prepare men and women for the general practice of medicine and not for a specialized field. Observation teaches us further that 85 per cent of the daily practice of medicine consists of non-surgical cases. Why then do we find pharmacology and its correlated branches constituting only four per cent of the entire curriculum? May I offer an explanation of this peculiar phenomenon? About 25 years ago American Medical Colleges awakened to their responsibilities as well as their shortcomings. They initiated standardization and strengthening movements on the laboratory side of their curricula.

During recent years the medical sciences have passed from the qualitative to the quantitative phases of their evolution. Clinical laboratory methods have supplemented older ways of diagnosis. The biologist, pathologist and physiological chemist have contributed greatly to this wonderful development. A marvelous technique has been elaborated and an enormous amount of data bearing on diagnosis and prognosis has been collected. The pharmacologist has not been asleep, but has made remarkable progress toward the quantitative in a very difficult field. Synthetic chemicals, also serum therapy, have to a large extent occupied his mind, and, aside from the novelty of these forms of treatment, the readiness with which they lend themselves to standardization and specific effects has made a compelling appeal to the pharmacologist's scientific sense to the obscurement of the older preparations which were mainly an inheritance of an empiricism, in many cases lacking scientific confirmation; therefore, in drafting new medical curricula the vast amount of material available and the compounding of discovery upon discovery has complicated the selection of the essentials, of their apportionment and of their proper emphasis during this transition period from the empirical to the scientific, with the result it is natural to expect that the several sciences underlying correct diagnosis would be unduly emphasized and the treatment side of medicine would suffer thereby. However, it must be evident to us, as important as diagnosis may be, that it is of little use to the patient unless the facts established guide the physician to the most fit and adaptable form of treatment known to apply

to the individual's case. If sufficient time were allowed in medical curricula to give proper attention to materia medica and its applications, the future physician should have an adequate equipment of such knowledge. In consequence he would foresee the necessity for and the advantage of the art of pharmacy. He would not only embrace the opportunity of using his scientific aids to diagnosis, but he would also use his knowledge of the materia medica for the specific treatment of the peculiarities in the individual patient rather than allow his patient and himself to remain at the mercy of some semi-secret preparation, the advocates of which are actuated by non-professional motives and whose product may nullify all of the physician's efforts and learning up to and including the treatment of his patient's sickness.

So far, my paper has been wholly critical, but I have a constructive suggestion to offer. You are no doubt familiar with the dissatisfaction of the rank and file of the medical profession with the present medical curriculum as expressed through the columns of the *Journal of the American Medical Association* and other medical periodicals. Now is the time, I believe, to enlist the pharmacologist and therapeutist in a movement to see that their very important branches of medical study are given a uniform and sufficient quota in the undergraduate medical course. Our missionaries must be carefully selected individuals from our organization whose personal contacts and prestige are well enough established to gain for them a respectful audience. In this way a great amount of good can be done for medicine, the public's welfare and for American pharmacy.

ABSTRACT OF DISCUSSION.

J. G. Beard said that he had found one of the finest fields for missionary work among medical students and he hoped that he had been able in a small way to give them a better understanding of what pharmacy is and a higher appreciation of the calling than they could possibly have gotten in any other way.

William Mansfield asked how Professor Beard divided his work, how much he devoted to the history of pharmacy and how much he gave to lectures and whether any work was done in the manufacture of official preparations.

In replying, Professor Beard explained that the Laboratory part takes in incompatibilities, not much dispensing, but quite a number of the official preparations are manufactured. The lecture part of the course varies from year to year.

H. J. Goeckel held that this was a very important paper and being primarily a pharmacist he thought that it brought out an opinion which this section should take up to show that medical schools are deficient in their system and there is dissatisfaction with their courses.

H. C. Wood said he had the privilege of teaching in a medical school and also in a pharmacy school, that he had been teaching therapeutics for more than twenty-five years and he was inclined to agree with Mr. Lakey in his main observations that the teaching of materia medica and allied subjects in some of the medical schools is deplorably deficient. However, he wanted to take issue with the author relative to the reason for this deficiency. He held very strongly to the philosophy that history repeats itself and the progress of medicine is in sight. A cycle is just ending which was brought about by a very famous clinician, one of whose claims to fame, at least, was his advocacy of what was known as therapeutic nihilism—he advocated putting patients to bed and seeing if nature would not cure them without interference by the use of drugs. He was a man of very remarkable ability and had a large personal following, and a tremendous influence on the medical thought of the United States. To him, to a very large extent, is attributed this therapeutic nihilism which was all the rage ten years ago. The men who are coming on to-day as teachers were educated ten years ago and they are still suffering from what they were taught as students; but in his opinion drugs are coming back into use again. He

wanted to remind members of the pharmaceutical profession that the history of medicine shows quite a number of resurrections. At one time every disease was treated with a lancet but after a while it was found that this method would not cure all diseases. He hoped to see the day when pharmacology or pharmaco-therapeutics will again come into its own.

Then followed a discussion of a resolution presented by the author on the paper.[1]

Speaking on the resolution, H. C. Wood said that he hoped this resolution would not be adopted. He was certain that it would not be received kindly by the medical profession; that the medical profession of which he is a member feels competent, whether this was the case or not, to run medical affairs without interference from other organizations.

J. G. Beard said that he appreciated the feelings of Dr. Wood, but he thought the spirit of this resolution could not be objected to, however much the letter of it might be open to criticism. He was certain Mr. Lakey simply wanted to express to the medical profession the thought that we would like more of the pharmacological work in the under-graduate curriculum.

J. H. Beal asked whether it was in order to adopt the resolution which, in his opinion, expressed that which had been repeated many times in the pages of the medical journals. He was of the opinion that practitioners of medicine know and admit that the instruction of the young physician in therapeutics to-day is distressingly deficient. He thought that the resolution was a good one and that it should be adopted.

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[1] The resolution as adopted reads:

Be it resolved that a Committee be appointed from the AMERICAN PHARMACEUTICAL ASSOCIATION to confer with the Committee on Curriculum of the American Medical Association with the view of discussing the wisdom of expanding the medical curriculum as it relates to the teaching of pharmacology and therapeutics to under-graduates in medicine.

MOTHPROOFING BY MEANS OF CINCHONA ALKALOIDS.

"L. E. Jackson and Helen E. Wassell (*Industrial and Engineering Chemistry*, Vol. 19, No. 10) find that cinchona alkaloids, or their derivatives, are effective for commercial application. Their use as insectifuges has been a subject for industrial research extending over four years and constitutes U. S. Patent 1,615,843 (February 1, 1927). A long list of chemicals were selected for test and only cinchona alkaloids were found to satisfy the criteria of excellence laid down for moth-repellants, *viz.:* (1) Absence of odor. (2) Adherence to treated fiber. (3) Invisibility. (4) Not removable by dusting or brushing. (5) Do not damage fibers. (6) Soluble in cheap organic solvents, such as petroleum naphtha, as well as in water. (7) Non-toxic. (8) Repels moths. (9) Economic cost. The original test, pieces of wool treated with an alcoholic solution of quinidine sulphate, have withstood moth attack under most favorable conditions, including incubation after inoculation with eggs and living larvæ of moths. The cinchona alkaloids attach themselves to the fiber-like dyestuffs, and their moth-proofing characteristics are probably due to a combination of properties, including salt formation, bitterness, astringency, germicidal action and intestinal irritation.

"Practical tests consisted in treating clothing, rugs and furniture with cinchona alkaloid compounds dissolved in water, dry cleaners' petroleum naphtha, or carbon tetrachloride. Clothes-moths were exterminated and insects did not re-enter treated fabrics. The only safeguard required is after dry cleaning or laundering as this removes the moth-repellant alkaloids, so that re-mothproofing is essential. Brushing, dusting, shaking and such ordinary usage is apparently without effect upon the protection against moths."

EXPORT OF EPHEDRA VULGARIS FROM CHINA TO THE UNITED STATES.

A phenomenal increase in the exports of *ephedra vulgaris* from China to the United States is disclosed in reports of Vice Consul A. J. Ward, Tientsin, China. Among the crude drugs declared for export to the United States during the first seven months of 1926 and 1927, figures for *ephedra vulgaris* were 8317 pounds valued at $741 and 477,218 pounds worth $53,652, respectively.

Of the 477,218 pounds shown for the first seven months of 1927, more than one-third or 147,582 pounds, value $15,667, was exported in July.

ANDREW CRAIGIE, THE FIRST APOTHECARY GENERAL OF THE UNITED STATES.*

BY LYMAN F. KEBLER.[1]

No more appropriate character could have been selected for a biographical sketch, at this meeting, in this city, celebrating the Sesquicentennial, than Andrew Craigie. Philadelphia was one of his stamping grounds. Valley Forge can testify as to his services. He was the Prince of Apothecaries during the Revolution.

Andrew Craigie, the son of Andrew and Elizabeth Craigie, was born in Boston, June 7, 1743. This is the birth year of Thomas Jefferson, Antoine-Laurent Lavoisier and Martin H. Klaproth. Craigie was educated in the Boston Latin School. This seems to be all that is recorded of Craigie until we find him appointed, April 30, 1775, by the Committee of Safety of the Province of Massachusetts, to take care of its medical stores. Information is wanting as to whether he was educated as an apothecary or a physician, or his previous business connections, except that he was a man of ability and skilled in medicine. There apparently is no picture of him in existence. This is regretted because a likeness adds so much to a personal sketch.

Dr. J. M. Toner,[2] an authority on the medical men of the Revolution, says:

> "He was a man of education, address and good business habits and qualifications. I have not learned with whom he studied the business of an apothecary or whether his studies inducted him regularly into the medical profession."

He lists Craigie among the physicians and surgeons. As an original member of the Society of the Cincinnati, he gives him the title of "Surg. Gen. Hosp." From other sources we have it that he was large of frame, heavy, fond of display, prosperous, generous and given to lavish hospitality. A staid patriotic Whig. A wholesale apothecary. An alert investor and Yankee speculator. A picturesque character.

CRAIGIE LIVED IN STIRRING TIMES.

Craigie lived during stirring times. Men's souls were tried. Science and liberty were in the molding. In order to visualize his environments and the conditions obtaining, it is necessary to briefly summarize certain salient, historical features, both preceding and during the Revolution.

William Penn in 1697 proposed an annual congress of the Colonies with power to regulate commerce. The Board of Trade in London mainly controlled their affairs. That great statesman, Benjamin Franklin, on July 4, 1754, at the fourth Colonial Convention at Albany, 22 years before the Declaration of Independence, revived Penn's idea and breathed life into it. He planted the germ of the union. Eleven years later the obnoxious Stamp Act was passed. Virginia was the first to resist it, May 1765. Threadbare coats were there in fashion, as a protest.

British troops marched into Boston on a September Sabbath morning, 1768, beating drums and flying colors, to overawe the people. Indignation could hardly be restrained. The people tried to drive them out of the city. On March 5,1770,

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* Presented before Section on Historical Pharmacy, A. PH. A., Philadelphia meeting, 1926.

[1] Bureau of Chemistry, U. S. Department of Agriculture.

[2] Manuscript in Library of Congress on the "Medical Men in the American Revolution."

the soldiers fired on the citizens, killing three and wounding others. This is known as the "Boston Massacre." Nearly forty "Regulators," citizens of North Caroline, were killed in May 1771, in what is known as the first battle in the war for independence.

The first[1] sea fight took place June 17, 1772, between the schooner Gaspé and the packet Hannah, the former attacking and grounding. Then sixty-four Americans disguised as Indians attacked the Gaspé at night, with a shower of paving stones, shot the captain, burned his vessel and took the crew prisoners.

A duty was laid on teas in 1767, but the odious Tea Act, passed in May 1773, accentuated existing trouble. Philadelphians were the first to publicly protest the landing of tea, October 2nd. The Boston Tea Party took place December 17th. The mother country condemned this act as enormously criminal. Five other tea parties were held the next two years along the Atlantic coast from Annapolis to Nova Scotia. The port of Boston was closed to the colonists, June 1, 1774. The first Continental Congress assembled in Carpenter's Hall, Philadelphia, then the largest city in America, September 5, 1774.

On October 7, 1774, was formed[2] the Provincial Congress of Massachusetts which continued (p. 32)[3] the Committee of Safety, clothing it with large powers, even to the calling out of armed forces. One of the first tasks, December 20, 1774, (p. 506) of this committee was to have an inspection made of "the commissaries' stores, in Boston, and report what surgeons' stores and stores of other kinds are there." Craigie probably had a hand in this. New Englanders were forbidden fishing on the banks of New Foundland, February 10, 1775; this was called the "Starvation Act."

COMMITTEE PROVIDES FIFTEEN MEDICINE CHESTS.

The Committee of Safety and the Committee of Supplies voted[4] February 21, 1775, that Drs. Warren and Church be a committee to bring in an inventory as to the necessities of their profession for an army of 15,000 men.

Another committee was appointed February 24th (p. 512) to inquire where fifteen doctor's chests could be secured and on what terms. At the next meeting March 7th, it was directed "to purchase such articles for the provincial chests of medicine as cannot be got on credit." On April 17th (p. 517), it was voted to distribute the medicinal chests as follows: Two each at Concord, Worcester, Lancaster, Medon, Gorton and Stow and three at Sudbury; "That sixteen hundred yards of Russia linen be deposited in seven parts, with the doctor's chests; xx."

The Battle of Lexington, the Concord skirmish and the burning of Charleston took place April 19, 1775, costing the Americans 88 and the British 273 men, besides the wounded. The colonial sick and wounded, so far as their condition permitted, were ordered (p. 527) to be moved into the hospital, April 29th. Patriots by the thousand of the various colonies answered the cries of distress by gathering about Boston with their muskets.

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[1] "Hist. of Our Navy," John R. Spears, 1, 5 (1897).

[2] "J. Prov. Cong. Mass.," 6 (1774).

[3] This form of reference carries back to the last publication mentioned.

[4] "J. Prov. Cong. Mass.," 509 (1775).

The Lexington affair fired men's souls. Soon after the news reached Machias, Maine, the second sea skirmish took place.[1] Thirty-five men, called "Yankee Haymakers," armed with pitch-forks, axes and 20 nondescript guns, commandeered a lumber sloop and attacked the armed British schooner Margaretta, with 40 men aboard. Fighting was desperate. The Americans won. Twenty men were killed and wounded. On December next the American Navy took form.

CRAIGIE APPOINTED TO CARE FOR MEDICAL STORES.

The Committee of Safety, April 30th appointed[2] Dr. Craigie to take care of the medical stores and deliver them out as directed. This is the first record, since his Latin School connections, of a man who played such an important part in the pharmacy of our country. The provisions and chest of medicine (p. 544) in the Vassall House (considered later) were ordered stored awaiting further directions. This provides 16 medicine chests. One wonders as to their make-up. On May 14th, Mr. Craigie (p. 545) was directed and empowered to impress beds, bedding and other necessaries that may be needed for the sick. This is still a part of the apothecaries' duties.

Gage had 10,000 troops in Boston when he declared martial law June 12th. The New England Army before Boston by this time numbered 16,000, representing various parts of the country. The disturbance was more than a local affair. Here was an army with its multiplicity of problems to meet. The sick and wounded must be cared for. Complaints naturally arose.

COMMITTEE TO SUPPLY MEDICINES.

On June 12, 1775, the Third Provincial Congress (p. 321) directed "that Doct. Whiting, Doct. Taylor and Mr. Parks, be a committee to consider some method of supplying the several surgeons of the army with medicines." Report (p. 323) of the committee reads:

> "The committee appointed to take into consideration a complaint that the surgeons in the army are not properly furnished with medicines, have attended that service, and beg leave to report: That whereas, it appears that there is not, as yet, a sufficient number of medicine chests provided to furnish each regiment with a distinct chest; and whereas the committee of supplies are making provision for the supplying of each regiment with such medicine chests as soon as possible; therefore, Resolved, that the committee of supplies be, and hereby are directed, immediately to furnish the surgeon of the first regiment at Roxbury, each of them with a medicine chest, for the present; and that all the other surgeons in the army at Cambridge and Roxbury have free recourse to the said chests, and supplied from them, from time to time, as they shall find occasion, until more ample provision shall be made for them;"
>
> "Ordered, that the same committee be appointed to examine into the medical stores, and make a list of what is necessary and bring in a list of what medicines are in the medicinal store; and that they be directed to report what instruments are necessary for the surgeons of the army."

On May 10, 1775, the second Continental Congress convened in Independence Hall. It was largely occupied in devising way and means for carrying on the impending war. Washington was selected (June 15th) Commander-in-Chief of the army. The battle of Bunker Hill took place June 17th. Four hundred and fifty of the Provincials were killed and wounded. Craigie was in this battle and assisted

[1] "Hist. of Our Navy," John R. Spear, 1, 15 (1897).
[2] "J. Prov. Cong. Mass.," 530 (1775).

in caring for the sick and wounded. This battle brought many additional service problems for the apothecaries and physicians to solve. The very life of the colonies depended on their keeping the men fit for the fighting line. Hospital facilities and medical supplies were urgently needed. The first hospital[1] in the colonies was organized in Philadelphia, 1751. On June 19, 1775,[2] the house of Rev. S. Cook of Menotomy was taken over as a hospital, and Dr. Foster was:

"directed to take up and improve as hospitals, so many houses in Menotomy as he may find necessary for the safety of the sick and wounded of the colony army, and that he employ such person or persons as may be necessary to carry such provisions and other necessaries as may be wanted for use of the aforesaid sick and wounded; and further, that he take such precautions, respecting the small pox hospital, as may be necessary for the prevention of the spreading of that epidemical disorder in the camp or elsewhere."

By the end of June, two additional hospitals were established, one at Cambridge and the other at Roxbury. Both were in one or more private homes. Everything possible was done by the colonies to provide for the sick and wounded.

CRAIGIE APPOINTED COLONIAL APOTHECARY OF MASSACHUSETTS.

One year before the Declaration of Independence, the greatest of Magna Chartas, the Massachusetts Provincial Congress (p. 448) directed that Andrew Craigie be appointed "a medical commissary and apothecary for the Massachusetts army, and that he be allowed five pounds per month, for his services." The form of warrant approved (p. 450) reads:

"The Congress of the Colony of the Massachusetts Bay Greeting, to————————

"We, being informed of your skill in medicine, and reposing especial trust and confidence in your ability and good conduct, do, by these presents, constitute and appoint you, the said ———— ————, to be medical commissary and apothecary to the army raised by this Congress, for the defence of this colony. You are, therefore, carefully and diligently to discharge the duty of a medical commissary and apothecary in all things appertaining thereto, observing such orders and instructions as you shall, from time to time, receive from any of your superior officers, according to the rules and discipline established by said Congress, for which this shall be your sufficient warrant.

By order of Congress,

....., President."

This is the first act that gave apothecaries official recognition in America. Pharmacy had scarcely gained a foothold in America at this time.

STATUS OF PHARMACY, CHEMISTRY AND MEDICINE.

Physicians during colonial times generally dispensed their own medicines, prepared for them by their apprentices, studying medicine. Drug shops were largely owned by physicians. Medical apprentices, as soon as they were competent, opened shops and engaged in practice for themselves.

The first degree of Doctor of Medicine, an honorary one, was conferred[3] by Yale College in 1723, on Daniel Turner. A tract on pharmacy was written[4]

[1] "Watson's Annals of Phila.," 399 (1830).
[2] "J. Prov. Cong. Mass.," 571 (1775).
[3] "Early History of Med. in Phila.," Geo. W. Norris, 171 (1886).
[4] *Ditto*, 210 (1886).

in 1732 by Thomas Harward, a clergyman. Pharmacy, pharmaceutical chemistry and chemistry were taught[1] by Dr. John Morgan in the first Medical School in America, part of the College of Philadelphia, later the University of Pennsylvania, from November 1765 to 1769. Dr. Rush was given the chair of Chemistry in this college, in 1769. This gave chemistry an independent status, but still left pharmacy connected with medicine. In fact pharmacy and chemistry remained in the hands of medical men for years thereafter. Dr. Rush's letter of application[2] for the above position of chemistry reads:

"Gentlemen:

As the professorship of chemistry which Dr. Morgan has sometimes supplied is vacant, I beg to offer myself as a candidate for it.

Should you think proper to honor me with the chair, you may depend upon my doing anything that lies within my power to discharge the duties of a professor, and to promote the reputation and interests of your college.

I have the honor to be, with the greatest respect,

Your most obedient humble servant,

Benj. Rush.

Philadelphia, July 31, 1769."

Chemistry, pharmacy and medicine made notable strides in Europe during the lifetime of Doctors Craigie, Morgan and Rush. The revolution of Chemistry was in full swing. Pharmacy was intimately fused with chemistry.

DR. MORGAN URGES SEPARATION OF MEDICINE AND PHARMACY.

Dr. Morgan as early as 1765 urged[3] the separation of pharmacy and medicine in the following words:

"We must regret that the very different employment of physician, surgeon and apothecary should be promiscuously followed by any one man. They certainly require very different talents. The business of pharmacy is essentially different from either, free from the cares of both, the apothecary is to prepare and compound medicines as the physician shall direct."

In further urging the separation of the duties of physicians and apothecaries, he says:

"The paying of a physician for attendance and the apothecary for his remedies, apart, is certainly the most eligible mode of practice, both to the patient and practitioner. The apothecary then, who is not obliged to spend his time in visiting patients, can afford to make up medicines at a reasonable price; and it is as desirable as just in itself that patients should allow fees for attendance, whatever it may be thought to deserve. They ought to know what it is they really pay for medicines, and what for physical advice and attendance."

Dr. Morgan was well qualified to speak on this subject. He was an apprentice of the eminent Dr. John Redman for six years and was acquainted with the practice of other prominent physicians of his time, particularly with those connected with the Pennsylvania hospital, whose prescription he filled as apothecary for more than

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[1] "Early History of Med. in Phila.," Geo. W. Norris, 157–160, 168 and 175.

[2] *Am. J. Pharm.* 76, 12 (1904).

[3] "Discourse upon the Institution of Medical Schools in America," Abst. in *Am. J. Pharm.* 76, 7 (1904).

a year. Part of his medical education was acquired in Europe where pharmacy enjoyed an early and notable development, particularly in France.

In order to carry out these views he refused to furnish medicine and sent his prescriptions to a party educated in pharmacy, he had brought with him from England. The plan of physicians devoting themselves to the practice of medicine solely did not meet the approval of his contemporaries. In fact it gave great offense in some quarters. Dr. Morgan stood by his convictions. He was not a vacillator. He had only a single follower previous to the war of the revolution which was the making of medicine and pharmacy in this country.

MEDICINES IN HIGH ESTEEM IN COLONIES.

Even though pharmacy had received little recognition up to this time in America, medicines were held in high esteem. Colonial records teem with their use. Dr. C. A. Browne[1] in a paper on "Some Relations of Early Chemistry in America to Medicine," calls attention to a few. Governor John Winthrop, Jr., one of the most renowned practitioners of his time, prescribed antimony, green vitriol, sulphur, saltpetre, white vitriol, aloes, rhubarb, calomel, balsam and some galenicals. An air of mystery surrounded some of them, particularly his "Rubila," which he prescribed for ague, small pox, coughs and other complaints. It seemed to be a mixture of sodium nitrate, antimony sulphide and a salt of tin, colored red.

Digby's sympathetic powder, green vitriol dried, discussed by A. C. Wootton,[2] held sway in the colonies. A "magneticall remedy for the agewe." From another source[3] we have it that originally this celebrated "Powder of Sympathy" was a salve. Cures were effected by being brought in contact with the agent that inflicted the wound or a bandage removed therefrom. It was the subject of several debates at Harvard College, 1693–1710. The results were always in favor of the sympathetic powder. This shows the views of learned men in those days.

Dr. Muirson's famous mercurial inoculation for small pox, invented in 1731, was extensively used for some fifty years to control epidemics of this disease so prevalent and serious during the revolution. It consisted of heavy doses of calomel, followed by equally large doses of antimony, cream of tartar and sulphur. The treatment was then stopped for several weeks and the patient inoculated with small pox. Mercury and antimony were in their heyday. George Starkey, a Harvard graduate and chemical practitioner, used them abundantly. He also invented a number of remedies. His oil of sulphur is the best known.

MYSTERIES OF MEDICINES.

Antimony was supposed to cure by simple contact. The "everlasting pills" made from antimony sulphide, kept as a family remedy, passed through the body unchanged, and used again and again, were believed to act on this principle.

Even during the last days (1821) of Napoleon, at St. Helena, when groaning and writhing in the agonizing pains of cancer of the stomach, the attending physician prescribed for him tartar emetic in lemonade.

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[1] *J. Chem. Education*, 3, 267 (1926).

[2] "Chronicles of Pharmacy," 1, 196 (1910).

[3] "The Life of Sir Kenelm Digby," 50 (1896).

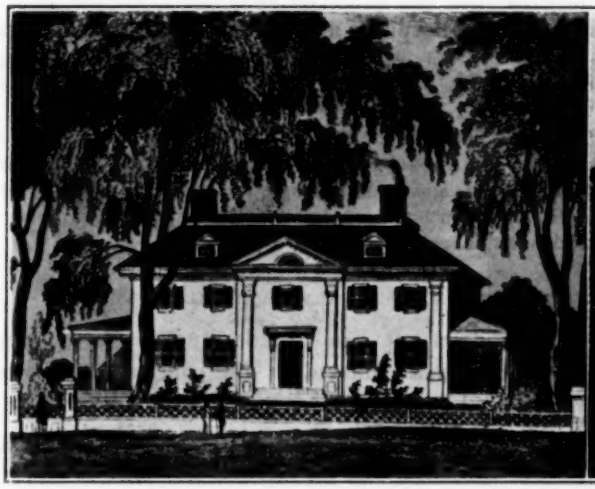
Wootton in discussing the antimony medicinals, says:[1]

"It would be tedious to go through the multitude of antimonial compounds which have become official and it would be impossible in any reasonable space even to enumerate the quack medicines with an antimonial base which were so recklessly sold in this and other countries."

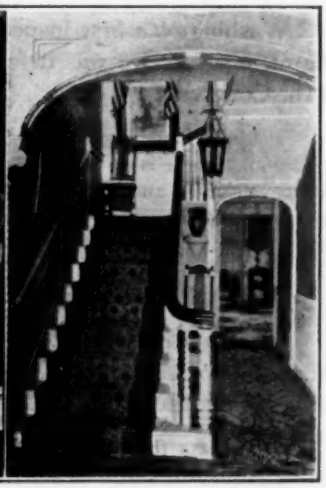
Pokeberries were used[2] for cancer, grapevine juice to grow hair, dogwood flowers to cure dysentery, boneset to cure consumption, "Chinese stone" for rattlesnake bite, cancers, gout, rheumatism, etc.

The above glimpses give a meager idea of the faith and mysticisms of medicines during colonial days and explains in a measure the part they may be expected to play during the revolution.

Sometimes we get the impression that there was a scarcity of drugs in those days, but an extract quoted by G. W. Norris[3] gives an entirely different idea.



Washington's Headquarters at Cambridge—The Vassall-Craigie House—from *Dr. James Thacher's Military Journal.*



East Entry, Vassall House—Medical Headquarters from an "Historic Guide to Cambridge," 1907.

He says:

"Dr. (Sylvester) Gardiner was the most noted and extensive druggist in New England, and took sides with the mother country. He escaped to England, and the Legislature of Massachusetts having enacted that all property belonging to Tory refugees should be confiscated for public use, his estate was sold at public auction. His stock of drugs was said to have filled over 20 wagons. Thacher."

Soon after General Washington's appointment he left for Cambridge, the scene of action. He arrived July 2nd and the next day took command of the army, making effective the "Siege of Boston." The Vassall House, later Craigie House, was his headquarters. Craigie played a prominent part in this siege. Congress provided for the appointment of general officers but singularly enough no provisions

[1] "Chronicles of Pharmacy," 1, 382 (1910).
[2] "Watson's Ann. Phila.," 603 (1830).
[3] "Early History of Med. in Phila.," 205 (1886).

were made to take care of the sick and wounded. On July 4th[1] the Provincial Congress of Massachusetts appointed a committee to inform the General of the provisions made for the sick and wounded. Complaint was made that several men were seriously sick and their lives endangered for lack of medicines that the surgeons had applied for but could not get.

CRAIGIE DIRECTED TO PROCURE MEDICINES.

Mr. Commissary Craigie was therefore directed (p. 597) "to procure at the expense of the colony such medicines as were immediately and absolutely necessary," in the following language:

"Sir:

You are hereby desired immediately to supply the store under your care, with such medicines as are absolutely necessary for the present relief of the sick in the army."

Washington's first inspection of the hospitals apparently convinced him that the medical service was defective. On the 21st of July he wrote[2] the President of the Congress:

"I have made inquiry into the establishment of the hospital, and find it in a very unsettled condition. There is no principal director, nor any subordination among the Surgeons of consequence, disputes and contentions have arisen, and must continue until it is reduced to some system. I could wish it was immediately taken into consideration, as the lives and health of both officers and men so much depend on a due regulation of this department."

OFFICE OF GOVERNMENT APOTHECARY CREATED.

The Continental Congress two days previously had directed the appointment of a committee of three to consider this matter. The committee reported a bill which after due debate was agreed to and reads:[3]

"That for the establishment of an hospital for an army, consisting of 20,000 men, the following physicians and their attendants be appointed, with the following allowance or pay, *viz.*: One Director General and chief physician, his pay per day, four dollars. Four surgeons, per diem each, one and one-third of a dollar. One apothecary, one and one-third of a dollar. Twenty (Surgeons) mates, each, two thirds of a dollar. The duty of the above officers, *viz.*: Director to furnish medicines, bedding and other necessaries, to superintend the whole and make his report and receive orders from the commander-in-chief. Surgeons, apothecaries and mates to visit and attend the sick, and mates to obey the orders of the physicians, surgeons and apothecary."

The scheme was unsatisfactory in many ways but it was a long step in advance of the medical affairs then obtaining. It created the first government position of apothecary. One of his duties was "to visit and attend the sick." This recognized apothecaries as medical practitioners and is in harmony with conditions prevailing in England at the time.

MEDICAL DIRECTOR AND APOTHECARY APPOINTED.

Dr. Benjamin Church, a member of the Provincial Congress and general director of the hospital at Cambridge, was unanimously elected July 27th (p. 211)

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[1] "J. Prov. Cong. Mass.," 445 (1775).
[2] "The Med. Dept. U. S. Army," p. 6, Harvey E. Brown (1873).
[3] "J. Cont. Cong." (C. L. Ed.), 2, 209 (1775).

by Congress, the first director and chief physician of the Colonial Army. The appointment of the apothecary was left to Doctor Church. He probably appointed Doctor Craigie to this office, but definite information is wanting, except that we find the Doctor holding the position several months later. Dr. John Brown Cutting was assistant apothecary to Craigie at that time.

Soon after his appointment by the Continental Congress Dr. Church conferred with several State officials regarding the appointment of apothecaries for the medical store at Watertown, Mass., and to take care of and compound the medicines for the use of the army. A committee appointed by both Houses of Massachusetts reported August 3rd:[1]

"That the Medical Store in Watertown be continued where it now is, and that Mr. Andrew Craigie appointed by the late Congress Apothecary to the Colony, be directed to take care thereof, and prepare the necessary compositions; and that Mr. James Miller Church be appointed Assistant Apothecary to said Store, to put up and distribute said Medicines, agreeable to the orders of the Committee appointed by the late Congress to take care of the Medical Stores; and this Committee would further recommend that an establishment be made for said Apothecary and Assistant Apothecary."

Vassall House—Headquarters Medical Department.

Washington's Headquarters—John Vassall-Craigie—Longfellow House.

Provisions are here made for quarters for the Apothecaries. The new director did little or nothing to improve hospital conditions and quarreled with the regimental surgeons. There were so many complaints that Washington was obliged to order an investigation into the management of the sick. Doctor Church, one of the most trusted and influential colonists in Massachusetts, high in the "Sons of Liberty," a member of the Continental Congress, deputed to receive and welcome the new Commander-in-Chief of the Army, after less than three months of service, was taken into custody (October 14th) because of traitorous correspondence with the enemy. A tremendous shock. The first traitor of the conflict. The records show[2] that he wrote this traitorous letter some time before he was appointed director. The introductory portion of this letter of July 23rd, reads: "I hope this will reach you. Three attempts have I made without success." He may have written this unfortunate letter in the Vassall House,[3] the headquarters

[1] "Am. Arch.," 3, 306 (1775).

[2] Am. Arch., 2, 1713 (1775).

[3] There were and still are two Vassall houses in Cambridge. Writers are at times indefinite as to which one is meant. Due to this fact there may be some incorrect reference thereto in this write-up.

of the medical department of the army. Here many a brave man, wounded at Bunker Hill, probably breathed his last. Here we are told Dr. Church was confined after his arrest. Corroborative evidence is the name "B. Church, Mr." carved in the wooden door of the prison room. A sonnet written in one of the old time albums, reads in part:

"Idly stood Church and leaned his heavy head,
On window panes, that shut me from the sight,
Of rolls of honor where men's names were bright—
He scratched his name on prison door instead."

It was generally believed that Dr. Foster would be Church's successor, but Dr. John Morgan was elected (Oct. 17th) to succeed him. Dr. Morgan's term of service was also short, less than fifteen months. He was dismissed (Jan. 9, 1777), as the result of discord, dissensions and intrigues, for which unfortunately he was not entirely blameless. An investigation by Congress, covering more than two years, vindicated him (June 12, 1779) but he was not restored to office. He felt greatly humiliated and seems never to have completely recovered.

DISCORD AMONG MEDICAL MEN.

The discord among medical men during his time must have been very acute. Many of those first commissioned were never educated into the medical profession; they were ignorant, factious and turbulent. General Washington characterizes them as "a disgrace to the profession, the army and to society." In a letter to the President of Congress, September 24, 1776, he speaks[1] of some of the regimental surgeons and mates as "very great rascals," and says:

"They are aiming, I am persuaded, to break up the General Hospital and have, in numberless instances, drawn for medicinal stores in the most profuse and extravagant manner for private purposes."

This probably accounts for the depleted condition of the medicine chests later reported.

OFFICE OF DRUGGIST CREATED AND FILLED.

To what extent Dr. Morgan put into effect his idea of separating pharmacy and medicine, during his tenure of office as Director General and Physician in Charge of the American Hospital, is not evident. On July 17, 1776, Congress increased the pay of the hospital apothecary to $1. 2/3 per day, and in August elected a druggist (Dr. Wm. Smith) in Philadelphia, to "receive and deliver all medicines, instruments and shop furniture, for the benefit of the United States," at $30 a month. The Director General after urgent appeal appointed an apothecary to the Northern Hospital and sent enough medicines for six regimental chests. With the creation of the office of Druggist, a line of duty was provided quite different from that of the apothecaries. It is not clear to what extent the Director General was to be relieved of the duty of purchasing stores, by this arrangement, but it appears that the active duties gradually devolved on the Druggist Elect. He became a purchaser and receiver of supplies.

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[1] The Early History of Med. in Phila., 63 (1886). Norris.

Congress was repeatedly called on to provide ways and means for supplying the army with medicines.

CRAIGIE'S INVENTORY OF COLONIAL DRUGS, 1775.

As a result of the investigation of Doctor Morgan it was brought out that he had an inventory made of the medical supplies at the time of taking office. In a letter to the Medical Committee of Congress, July 1776, he says:[1]

"(June 19th) I found the hospital and army without medicines and necessary stores for the sick, but by my personal application an ample collection of both were made.

"To obtain an idea of the quantity of medicines in the store of the general hospital, at my arrival, exclusive of those I ordered with me at Cambridge, I directed a return to be made, which was accordingly done, and which I now lay before you, signed by Andrew Craigie, Apothecary, Dec. 2, 1775.

"The number of medicinal articles included therein amounted to one hundred and twenty, of which many were useless or in little demand and of no value; and many especially of the articles in most demand were in very small quantities. And first, the articles in largest amounts were as follows:

Of	Aloes	15 pounds	Of	Manna	27 pounds
	Jesuits bark	52 pounds		Nitre	16 pounds
	Pearl barley	12 pounds		Oil of vitriol	29 pounds
	Lapis Calaminaries	44 pounds		Bad rhubarb	86 pounds
	Camomile flowers	24 pounds		Purging salts	76 pounds
	Cream of tartar	18 pounds		Snake root	62 pounds
	Ginger	64 pounds		Sago	12 pounds
	Gum ammoniac, damaged	44 pounds		Castile soap	11 pounds
	Juniper berries	20 pounds			

The weight of the above articles, however, as they are, exceeded that of all the other medicines in the general hospital taken together.

The following articles, every person the least conversant with medicines, will allow, are of essential use in a military hospital, The quantities of these were in general so small, that excepting two of them, *viz:* Flies and Quicksilver, which are not in any great quantity, there was little more than a sufficiency of them for one good regimental chest and of some of them not a sufficiency for even one. These articles and the quantities are thus given:

Of Aloin	1 pound	Liquorice Stick	5 pounds
Balsam Copaiva	4 ounces	Magnesia	1/2 pound
Camphor	1 pound	Oil of Aniseed	1/2 pound
Spanish Flies	8 pounds	Oil of Amber	1 ounce
Gum arabic	1/2 pound	Oil of Mint	5 ounces
Jalap	5 pounds	Quicksilver	5 pounds
Ipecacuanha	1 pound	Tartar Emetic	1/2 pound

And these to supply an army of twenty thousand men! Of Spirits of Nitre or any quantity of volatile Salts, and some other articles of a like essential use, there was not any in the whole stock of the general hospital.

The quantity of Spices and the Cordial Waters were as follows:

[1] Penn. Packet, (June 19 and 24 1779).

"Of Nutmegs ¾ of a lb.
Cloves 13 lbs.
Mace 5 lbs.
Cordial Waters, none of any quantity."

This is an exceedingly interesting inventory. It shows that Andrew Craigie was the Continental Apothecary when Dr. Morgan took charge and must therefore have been appointed by Dr. Church. It gives an idea as to the number and character of drugs and the amounts then in use. It supplies the first and only information I have found as to the approximate contents of the medical or regimental chests. Pearl barley, sago and Castile soap were then classed as medicines. It embodies the first reference to Castile soap in connection with Government supplies and may be the first printed record in the United States of this old-time article. Laxatives were then apparently quite freely employed.

MEDICAL SUPPLIES FEBRUARY 1776.

(June 24th) "In the Army His Excellency, General Washington, on my representation to him for that purpose, gave out in orders Feb. 25, 1776, that every regimental Surgeon at Cambridge should deliver a report to the Director General, of whatever instruments, bandages, dressings and implements of surgery and of whatever medicines he had on hand in order to discover the state of supplies."

"In two battalions only were found a good assortment of medicines, in the remaining 22 none, or only in a very small quantity. Can anything convey an idea of greater deficiency in Hospital Stores?"

"I purchased and procured to be sent from Salem, New York and Philadelphia, as well as Boston, other large supplies of medicine, etc. In the list from Philadelphia, for example, are 30 lb. Camphor, 10 pounds Ipecacuanha, 7 lb. Opium, 50 lbs. of Quicksilver, 40 lbs. of Jalap, 68 lbs. of Manna, 186 pounds of Nitre, 200 lbs. Cream of Tartar, 269 pounds of Bark, and so in proportion of other and like important articles." "That I furnished 50 regimental chests compleat with medicines, and dressings to the regiments at Boston and New York and besides twenty chests sent to the Northern Department of Lake George; and a second large supply to Ticonderoga, . . ."

The above shows that there were seventy regimental medicine chests furnished, in addition to supplying the general hospital with drugs. There must certainly have been some standard for such chests but so far none has been found. So far not even one of these medicine chests has been found.

UNFORTUNATE CONTROVERSIES AROSE.

After Dr. Morgan's separation from the medical service, unpleasant controversies arose. They throw much light on the character of Dr. Craigie and account for the interruption of his service as apothecary for nearly a year. Some of these controversies were not very creditable to Dr. Morgan, who possessed many admirable qualities, but these contentions brought to light some of his frailties. If it were not for the fact that the hero of our story is involved, the curtain would be drawn over the unfortunate scenes.

The bitterest controversy occurred with his lifetime friend and co-worker and successor, Dr. Wm. Shippen, Jr., relative to the management of the medical service of the Revolutionary Army. Craigie is only indirectly concerned here.

(To be continued)

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

BALTIMORE.

The November meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, which was held at the Emerson Hotel on Tuesday evening, November 29, 1927, was unanimously voted an enjoyable occasion from several standpoints.

The congregating of the 54 members and friends around the festive board afforded an opportunity for friendly contact and fraternal exchange of ideas, rendered more enjoyable by the special music provided by Miss Dora E. Bockelman, soprano soloist, accompanied by Miss Betty Copenhaver.

The speaker was Prof. Robert L. Hobart of the Wharton School of Finance and Commerce of the University of Pennsylvania, his subject being "Increased Profits."

Professor Hobart stated that for a great many years the emphasis in business had been placed on more efficient production methods, and that it is only recently that the various agencies of distribution have been subjected to the scrutiny of scientific analysis in an attempt to outline an improved merchandizing technique. As a result every middleman from jobber on down to the retailer has been forced to review his position in the scheme of things and find out what value he adds to the goods that pass through his hands.

He further stated that the retail druggist had been a part of this great movement and in the face of intensive competition he has already effected many changes in the way of improved merchandizing methods. His great function as a middleman is to collect articles of commerce from the wholesalers and offer them for sale in a form that is demanded, at a location that is convenient and at a time when they are needed. Naturally he is interested in making a net profit that is sufficient to compensate for the risk and effort involved in the conduct of the business.

Professor Hobart was convinced that the success of any retail store depends upon three prime factors and the extent to which they are found will be a fair index of the net profit of the store. They are: first, skilful buying; second, reduced overhead; and third, increased sales.

He stated that skilful buying implies proper selection of merchandise to meet the demands of your trade, the taking of special discounts, cash discounts and quantity discounts without imperiling the rate of stock turn.

In discussing the second factor the speaker pointed out that reduced overhead is accomplished first of all by a close analysis of all expense items and a comparison of these figures with the yardstick standard of the Druggist Research Bureau. Abnormally high items are soon spotted and either accounted for or reduced. Careful inventory checks will indicate slow moving lines which involve a tie-up of capital without an adequate return on the investment.

In conclusion he stated that increased sales volume is easier to discuss than achieve and yet a large number of retail druggists have built up volume through the use of skilful

salesmanship, direct advertising, window display, counter display and attractive stock arrangement. No single factor is responsible for a successful business but all are necessary for increased profits.

President Kantner then called on several members, including Messrs. H. H. Robinson, S. Y. Harris, Chas. L. Meyer and Paul S. Pittenger, to discuss certain phases of the subject.

Finally, after the speaker and the soloists had been tendered rising votes of thanks, and after instructions had been given that the flowers used to decorate the tables be sent to the University of Maryland Hospital, Charles C. Neal was successful in securing a second to his motion that the meeting be adjourned. It was indeed an interesting and enjoyable meeting.

B. OLIVE COLE, *Secretary-Treasurer.*

CHICAGO.

The 170th meeting of the Chicago branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the University of Illinois, School of Pharmacy, Friday, December 9th, with President Gathercoal presiding.

The meeting was well attended, with well over 200 present. A reception was extended the new members received during the year.

The Lambda Kappa Sigma pharmaceutical society presented a three-act comedy entitled, "Inlaws and Outlaws." The comedy was very well presented and held the constant attention of the audience.

Following the play, refreshments were served in the new Pharmacognosy Laboratory. Music was furnished by the School of Pharmacy orchestra. Dancing in the halls of the new building continued until midnight.

S. W. MORRISON, *Secretary-Treasurer.*

DETROIT.

The November meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Thurdsay evening, November 17th. The meeting was preceded by a dinner and a regular home coming for Father Perrin, a former member of the Branch, who had recently returned from Rome, where he spent seven years studying for the priesthood. Thirty-five members and friends attended the dinner. This number was increased to more than fifty before the program began. Among the visitors were: E. S. Sater, Baltimore, Mr. Chase, of Bangor, Me. and Mr. Slaughter, of San Diego, Calif.

President Wheeler called the meeting to order. The minutes of the previous meetings were read by the Secretary and approved.

Treasurer Ingram reported on the purchase of the Stormfelz-Lovely $500.00 Gold Bond, which was approved by the Branch.

President Wheeler than asked the Secretary to introduce the speaker of the evening, Rev. Father D. Edmund Perrin, a former President of the Detroit Retail Druggists' Association and member of the Detroit Branch, who had changed his career from a healer of the body to a healer of the soul.

Father Perrin preceded his very interesting talk on Rome by a tribute to the memory of Charles F. Mann, with whom he was associated for nine years, and to the late Messrs. Parker and Perry. He said these men were leaders in pharmacy in their day, and an inspiration to the young man entering the profession at that time.

Father Perrin took the assembly on a tour through Rome, and, as he said, covered more points of interest than would be possible to see in a two weeks' sight-seeing tour. He started with ancient Rome, B. C., coming down to the present time; going into detail in explaining the amphitheatres, the catacombs, the Roman customs, the churches and, finally, St. Peter's and its immensity.

A general discussion followed and one of the most sociable evenings of the year was brought to a close with a vote of thanks to the speaker.

DECEMBER.

The December meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Thurdsay evening, the 15th. Twenty-four members and friends attended the dinner. This number was more than doubled when the program opened.

President Wheeler called the meeting to order; the minutes of the previous meeting were read by the Secretary and approved. Chairman Lakey of the Program Committee told of arrangements that were in progress, to bring Dr. Ruth to Detroit for the February meeting. Dr. Ruth has two very interesting messages for the pharmacist in the form of Moving Picture Films—one on the manufacture of Biologicals and the other on Cod-Liver Oil. It has been suggested to make this a joint meeting with the physicians and students in Medicine and Pharmacy in Detroit. The Chairman also announced that any member wishing a copy of Dr. Beal's address at

the Diamond Jubilee Convention held in St. Louis could now obtain one.

President Wheeler asked Mr. Schettler to introduce Dr. Angus McLean, the speaker of the evening. In introducing the speaker Mr. Schettler related many pleasant experiences with Dr. McLean as a traveling companion, recalling the recent trip to Poland. He also said Dr. McLean has always been a staunch supporter of Pharmacy ethically and politically.

Dr. McLean immediately warmed up to the fine gathering of pharmacists by reminding them of the friendly relation that has always existed between pharmacists and the physicians. He said Pharmacy was older than Medicine and first practiced by the priests. In the 12th century the first apothecary shop was established but it was not until 1617 that a drug store was conducted by a legally licensed pharmacist in England. In 1675 Dr. Morgan of the U. S. advocated the separation of the practice of Pharmacy and of Medicine. He said the physician should prescribe and the pharmacist should compound the prescription. Dr. McLean said the Hebrews were the first to take up surgery and that Abraham was the first surgeon. The first Pharmacopœia in the U. S. was written in 1778. After these introductory remarks Dr. McLean spoke of the Fourth International Congress of Military Medicine and Pharmacy held in Poland, May 30th to June 4th of this year.

He said the Polanders were a great people, they had been without a country for 124 years, but constitute one of the most patriotic nations in the world. They have produced great writers, musicians and leaders, some of the outstanding being Kosciusko, Pulaski and Paderewski. He said one of the fruits of the World War was the freeing of Poland. The President of Poland is a chemist and pharmacist. The patriotism of the Pole was exemplified by Kosciusko and Pulaski who came to this country and helped in the war for independence. In their honor Fort Pulaski was erected on the Atlantic and Fort Kosciusko at West Point, and in Poland the people have erected a monument of earth in honor of Kosciusko. The earth, he said, was nearest to the Polander's heart.

The Congress held in Warsaw was called for discussing means to alleviate the suffering of the soldiers in time of war; 250 delegates attended, representing 43 countries. In honor of the Congress special postage stamps were issued, and courtesy was to be the by-word of the people. Some of the startling figures brought out during the Congress are: In 4000 years of wars 7,000,000,000 people have been killed or died as a result of wounds and diseases—three and one-half times as many people as are in the world to-day. Out of 250 wars only twelve decisive battles were fought. The absurd thing about war, as was brought out at the Congress, is that the very best men between the ages of eighteen and thirty-five are always in the first line.

The Congress devised means for a better and more efficient Pharmacy and Medical Corps in the armies and navies of the world, in time of peace and war.

A general discussion followed, led by Mr. Kaminsky, who asked the Colonel to tell the Branch something about the practice of Pharmacy in Poland. Dr. McLean said that in 1924 a National Pharmacy association was formed providing for a Board of Pharmacy and a Drug Act similar to those of the United States. Only graduates in pharmacy are allowed to dispense. They have a college of pharmacy and one of the finest laboratories in the world, supported by the Rockefeller Fund, where all patent medicines as well as drugs sold in the pharmacies are analyzed; even cosmetics are put through rigid tests.

Mr. Dodds, of the Michigan Drug Co., asked whether many American pharmaceuticals were found on display in Poland. To this Dr. McLean replied that many familiar products are obtainable while American pharmaceutical manufacturers' products are on display in every pharmacy.

Mr. Webster asked if it was the purpose of the Congress to devise means to eliminate wars. Dr. McLean said it was in part, and the statistics proved the needlessness and waste of wars.

A motion by Mr. Hall was adopted, expressing the appreciation of the Branch of Dr. McLean's most interesting and instructive talk and a rising vote of thanks was given to the speaker.

BERNARD A. BIALK, *Secretary.*

PHILADELPHIA.

The November meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, November 15th, at the P. A. R. D. Building, 2017 Spring Garden Street.

President Hendrickson called the meeting to order at 8.30 o'clock. By a motion from

the floor the reading of the minutes was dispensed with.

The Secretary introduced William Hendrie and A. C. Herting as contributing members of the Branch.

The President announced that at the next meeting the annual prescription clinic will be held, and each member was urged to bring one or two incompatibilities for discussion.

President Hendrickson gave a very unique demonstration on the making of Christmas merchandise out of regular stock material. His method was to take regular items, such as candy, stationery, kodaks, cigars, thermos bottles, toilet water, etc., and by tying a neat bow of red ribbon around each item, and inserting a small sprig of artificial holly, he gave the package a distinct Christmas season appearance. In a very few moments he had demonstrated the possibilities and had a table filled with numerous items ready for the Christmas sale. This plan, of course, eliminates the necessity of stocking up with special merchandise and tying up money for which there might be no return for some time. Any item left over after the Christmas season can be returned to regular stock, simply by removing the ribbon and holly. This plan met with the hearty approval of the members present.

Prof. Robert L. Hobart, of the Wharton School, University of Pennsylvania, next gave a most interesting talk on "Ways and Means of Increasing Sales in the Drug Store." He gave three possibilities for increasing profits. First, by decreasing the cost of merchandizing through skilful buying, by the taking of cash discounts, etc.; second by decreasing the cost of overhead, omitting sluggish items, etc.; third, by increasing the sales volume. He asked each retailer several questions which were very pertinent to proper sales: "Do you know your goods?"—"Are they on display?"—"Can you sell them when you have them?"—"Do your customers know what goods you carry?" He also summed up the qualities of a good saleman as he saw them, in Intelligence or the salesman's knowledge of his product and his ability to please, Interest or the salesman's earnestness in his customers' actual wants, and Courtesy, the consideration of the customers' sensibilities. Mr. Hobart has a very pleasing method of presentation and his thoughts were very well received and comments were made by a number of those present.

A rising vote of thanks was given to the two speakers of the evening. The usual dinner at the Touraine Apartments Restaurant preceded the meeting.

DECEMBER.

The December meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the P. A. R. D. Building, 2017 Spring Garden St., President Hendrickson presiding.

The reading of the minutes of the past meeting was dispensed with. An application for membership for Miriam Berman was received and was accepted pending action of the parent association.

The coming meetings of the Branch for the balance of the year were discussed by those present and several tentative programs were outlined.

The President turned the chair over to Prof. Nichols who conducted the annual Prescription Clinic. Many of the members present had brought odd and difficult prescriptions with them and these were copied on a blackboard and discussed by those present. Very lively discussion took place and, in all, thirty or forty prescriptions were considered. Then Prof. Nichols presented about a dozen incompatibilities and also submitted samples showing the preparation as properly prepared and also the preparation as carelessly prepared.

As far as interest was concerned the meeting proved to be one of the most successful that the Branch has had for some time, and it was again decided that the Prescription Clinic should be a feature of the Branch, an evening being devoted to it at least once a year.

ADLEY B. NICHOLS, *Secretary.*

UNIVERSITY OF WASHINGTON.

The regular monthly meeting was held November 19th, at Bagley Hall. Mr. G. Walen was elected as Vice-President to fill position left open by Vice-President-Elect, L. Schimpke, who failed to return to school this year. The Secretary gave a brief report on the program for the year which was followed by an outline for a membership drive, given by President Richards.

The President then introduced the speaker of the evening, Dr. W. M. Karschner. Dr. Karschner (also State Senator) gave as his title "The Relation between the Physician and Pharmacist." The doctor, who has had twenty-five years of practice in the West, gave first an interesting survey of the prac-

tice of medicine and pharmacy in this State a quarter of a century ago, tracing the development of the prescription writer in place of the dispensing doctor and naturally the development of the dispensing pharmacist. He gave many illustrations of mistakes made by both doctor and pharmacist and told how one worked with the other for their common good and for the good of the patients. The feeling of the patient who suffered a mistake on part of the druggist, which consisted of labeling boric acid solution for internal use and potassium iodide solution for eye drops, were vividly described. Also those of the patient whose bottle for cough syrup was labeled for external use and the liniment for internal use. He enumerated some of the disadvantages of the older days when it was necessary for the doctor to leave medicine. Verbal instructions were oftimes ignored. One patient reasoned that if one pill (strychnine) did a little good a lot would do much more. The result was nearly fatal. To guard against repetition of this the doctor told the wife of the next patient that the pills were poison. As a result she threw them out of the window where the chickens found them and then, according to the doctor's story, died. The doctor failed to state whether he received his fee or was required to pay for the chickens.

Then at the request of a member the Senator this time told about "Law making." The Senator has been an ardent supporter of the druggists and Colleges of Pharmacy and related some interesting instances of "politics" connected with the passing of laws.

After a brief general discussion the meeting adjourned, all leaving with the feeling that the evening was well spent.

DECEMBER.

The December meeting was called to order Thursday, December 8th, President Richards presiding. After a brief business session the meeting awaited the coming of the speaker of the evening, who was to present two films showing the manufacture of biologicals; however, he was unavoidably delayed and the program had to be deferred.

H. A. LANGENHAN, *Secretary.*

COMMITTEE REPORTS

REPORT OF THE COMMITTEE ON PHYSIOLOGIC ASSAYING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION FOR 1927.*

PAUL S. PITTENGER, *Chairman.*

During the past year it was necessary for the chairman of this committee to move from Philadelphia to Baltimore. The details incidental to this change and the equipment of his new office and laboratory made it physically impossible, in the early part of the year, to accomplish anything in the way of committee work. During the past two months the majority of the committee members were busy working on a series of coöperative experiments on the U. S. P. assay method for Digitalis. This work was planned by and under the direction of one of the committee members, Dr. J. C. Munch, of the Bureau of Chemistry, U. S. Department of Agriculture.

The Chairman thought it inadvisable, therefore, to plan further coöperative laboratory work at this time and accordingly thought it would be advisable that the Report this year take the form of a survey or synopsis of the work done in the field of Physiology from July 1, 1926 to July 1, 1927.

We, therefore, beg to submit the following bibliography with short abstracts of articles published during the above period.

This bibliography may not be complete but contains all of the articles that came to the Committee's attention.

ABSTRACTS FROM JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

July 1926.

G. G. Colin: "Study of the anti-diabetic properties of Tecoma Mollis. Preliminary report." Pp. 556–560. Experiments upon humans suffering from diabetes showed that an

* St. Louis meeting, 1927.

aqueous extract of tecoma mollis possessed hypoglycemic qualities. The solution can be sterilized without injury. One cc. subcutaneously caused a fall in blood sugar within two hours.

E. V. Lynn and Dorothy Gaston: "The relaxing action of some aromatic esters." Pp. 560–563. The depressor or relaxing action of 11 alcohols and esters closely related to benzyl alcohol were determined by their effect upon rat intestines suspended in a chamber filled with Locke solution. All members of this series inhibited or depressed smooth muscle to about the same extent as benzyl benzoate. The products used were: phenyl *n*-propyl alcohol, acetate and benzoate; benzyl methyl carbinol, acetate and benzoate; phenyl ethyl carbinol, acetate and benzoate; mandelyl acetate and benzoate.

J. C. Berardi: "Chemical and biological assay of drugs. Digitalis standardization: under anesthesia." Pp. 563–566. 0.02 cc. of a standard tincture of digitalis per Kg. body weight of a dog, intravenously, will reduce the heart rate 20 per cent in from 30 to 60 minutes. It was found that the heart rate under anesthesia increased greatly. When digitalis was given to dogs anesthetized with ether the heart rate was decreased from the rate under anesthetization, but was still above the normal rate.

August 1926.

Patrocinio Valenzuela: "Philippine ginger." Pp. 652–661. September, pp. 734–744. To determine the pungency, the modified Scoville method was used (1 per cent alcoholic solution is made by boiling one Gm. of the drug with alcohol for one-half hour, filtering and diluting into 100 cc. Two drops 5 per cent NaOH added to measured amounts of this 1 per cent solution and diluted to 100 cc. with water. 1 cc. of dilution held in mouth for 15 seconds produces an unmistakable warmth.) Cortex found most pungent and parenchyma least pungent. Limit of pungency for cortex was about 1:2500 to 1:5000.

September 1926.

Charles C. Haskell: "The action of caffeine on the poisoned heart." Pp. 744–747. Experiments upon dogs showed that caffeine depresses the heart in poisoning with morphine or with alcohol. It probably depresses the heart in dogs and in guinea-pigs which have received diptheria toxin.

E. A. Bilhuber: "Digitalis standardization at Geneva." Pp. 748–750. Reports discussion of Health Committee of League of Nations in September 1925. Cushny reported that cats fell into two classes when used for digitalis assay by a modified Hatcher method: one class showed definitely higher resistance to digitalis than the other. Cushny, Pick, Straub and Rost all reported the frog method a valuable means of assay. Committee recommended the frog method and Magnus modification of the cat method as sufficiently accurate for use. The frog method recommended is apparently a 4-hour frog method. The accuracy of the method is given as 10 per cent. A standard digitalis leaf prepared by Prof. Magnus is adopted as the international standard. A method of preparation of the extract from this leaf is given.

December 1926.

Thomas S. Githens: "Additional studies on Miré." Pp. 1067–1068. Aqueous or alcoholic extracts corresponding to 30 mg. of crude drug per Kg. injected into frogs cause characteristic jerking and twitching. Doses two or three times as large produce similar effects, the heart finally stopping in diastole. Intravenously, 300 mg. per Kg. in mice and 200 mg. per Kg. in rabbits, causes jerky respiration and slowing of pulse. This investigation showed that Manaca, which is very abundant and cheap, produces effects almost identical with those produced by the relatively rare and expensive Miré.

R. A. Konnerth and E. Pickering: "*Digitalis lutea vs. digitalis purpurea.*" Pp. 1069–1070. Sample of *digitalis lutea* grown in medicinal plant garden of College of Pharmacy, University of Minnesota, was assayed by U. S. P. IX frog method and found to be 125 to 133 per cent of the specified potency. As many samples of *digitalis purpurea* fell between 100 and 170 per cent of U. S. P. requirements the authorities concluded that the physiological activity of the two varieties are similar.

January 1927.

S. Palkin and H. R. Watkins: "The stability of atropine and hyoscyamine during process of analysis." Pp. 21–30. A physiological method of assaying mydriatics was developed by J. C.

Munch of the Pharmacological Laboratory of the Bureau of Chemistry, who determined the "threshold" doses (the concentrations of which one drop just produced a perceptible dilation of the pupil of the eye of a cat as compared to the untreated eye, which served as a control) of various mydriatic alkaloids. By the use of this method the results of chemical analysis were interpreted showing the stability of the solution of hyoscyamine and atropine in the form of the salts, and showing their instability as alkaloids.

Harry E. Dubin: "Nutritional value and standardization of cod-liver oil and of its non-saponifiable fat-soluble vitamine concentrate (Oscodal)." Pp. 41–45. This report dealt with the reports of various workers upon cod-liver oil. It touched upon the U. S. P. method for determining the antiophthalmic vitamine-A potency of cod-liver oil and similar preparations. References were also given to methods of determining the antirachitic potency.

February 1927.

D. I. Macht and J. C. Krantz, Jr.: "Effect of polarized light on the pharmacodynamic properties of some drugs." Pp. 106–110. Tinctures of digitalis exposed to polarized light for various periods of time ranging from 30 minutes to 6 hours underwent distinct deterioration in potency as is shown by tests upon frogs, frog hearts, gold fish, cats or *Lupinus albus* seedlings. Solutions of cocaine hydrochloride similarly exposed to polarized light were found to show marked deterioration in potency as indicated by effects upon gold fish and *Lupinus albus*. Solutions of quinine sulphate and tartrate tested by effects upon *Lupinus albus* were also reported to show a decreased toxicity.

David I. Macht and Justina H. Hill: "The effect of ultraviolet and polarized light on mercurochrome." Pp. 110–113. No appreciable deterioration in the potency of 1:500 solutions radiated for 30 to 78 minutes by ultraviolet and polarized light could be detected as shown by the effect upon growth of a 24-hour culture of B. coli.

L. W. Rowe: "The colorimetric assay of strophanthus." Pp. 113–115. The Knudson and Dresbach modification of the Baljet reaction was applied to a number of samples of ouabain and of tincture of strophanthus. The results were controlled by assays of the same preparations by the Houghton M. L. D. frog method of assaying cardiotonics. It was found that colorimetric determinations ranged from 20 per cent low to 40 per cent high with an average error of 10 per cent. Eliminating two extremes, the average error was 6.7 per cent. These results were based upon 14 preparations. In another series of 8 unknowns the average error was found to be 8 per cent after eliminating one sample which was 29 per cent high. The author concludes that strophanthus preparations can be assayed in a preliminary way with fair accuracy by the picric acid colorimetric method with a U. S. P. ouabain 1:25,000, or tincture strophanthus U. S. P. X diluted 1:140 as standards. The colorimetric assay of fluidextract of squill, convallaria and veratrum viride failed to give satisfactory results due to lack of color development.

W. R. Bond: "The biological standardization of digitalis based on the relationship of the M. L. D. to the heart weight." Pp. 137–140. The M. L. D. of tincture of digitalis was determined using the Hatcher and Brody cat method. After death the heart was removed from the pericardium, longitudinal incisions made in each chamber, and the heart washed in running water until free from blood. Excess moisture was then removed by a dry towel and the heart weighed. In 13 experiments decerebrate cats were used. Results were calculated in terms of milligrams of digitalis per Kg. body weight and in terms of milligrams of digitalis per Gm. of heart weight. Calculated upon the heart weight basis, the deviations were found to be 30 to 50 per cent less than when calculated upon the body weight basis.

"An Interesting and Valuable State Board Report (Michigan)." Pp. 156–158.

With reference to aconite, the report states that while chemical assays of samples of this drug may show it to be up to standard, the activity of the drug as demonstrated by the present official biological assay is often far below standard. There is reason to believe, therefore, the report continues, that the "unprecedented number of sub-standard samples of tincture of aconite" is due to hydrolysis of the aconitine and that the hydrolysis is caused by aging and its rate is materially increased by the manipulation given the fluidextract in preparing a tincture from it. The report promises that this matter will be further investigated.

March 1927.

M. I. Sparks: "The potency of various samples of digitalis grown in British Columbia:" Pp. 203–209. Assays of three samples of *digitalis purpurea*, two with purple and one with white blooms, and of a sample of *digitalis lutea* grown in Canada were made by the U. S. P. X one-hour frog method, and by the Magnus cat method. A sample of digitalis leaves grown in England and a sample of the international standard digitalis leaf prepared by Professor Magnus at Utrecht were also assayed. Certain discrepancies were found between the results by the cat and the frog methods; *digitalis purpurea* with purple blooms had practically the same activity as the *digitalis purpurea* with white blooms when tested upon cats, but by the frog method was definitely more potent. *Digitalis lutea* was apparently more active than *purpurea*. Sodium nitrate as a fertilizer increased the yield and the potency of *digitalis purpurea*.

David I. Macht and John C. Krantz, Jr.: "A phyto-physicological study of digitalis assay." Pp. 210–218. Dry *Lupinus albus* seeds were soaked over night in tap water at room temperature, then kept on moist sphagnum moss at about 20° for two or three days. The rootlets are then about 20 to 30 millimeters in length. The seedlings are then placed in Shive solution containing various substances to be studied. The effect of concentrations of tincture of digitalis ranging from 0.1 per cent to 1.0 per cent upon the rate of growth of the seedlings was determined. The same samples were then assayed by the Hatcher and Brody cat method. The authors report that the inhibition of the growth of seedlings is proportional to the concentration of digitalis solution used. They also claim that there is less variation in the phyto method of testing than in the cat method, and that there is a close agreement between results obtained by the two methods.

April 1927.

Edward E. Swanson and Chester C. Hargreaves: "The standardization and stabilization of aconite preparations—Paper III." Pp. 296–301. Continuing their previous work, this paper discusses the effect of p_H upon stability of tinctures and fluidextracts of aconite. The necessity for a standard technique of assaying aconite preparations upon guinea-pigs is developed. The authors starve 275–325 Gm. guinea-pigs for 24 hours, after they have been in the laboratory for a month on a standardized diet. The calculated dose is diluted to a total of one cc. with physiological salt solution, and injected into the subcutaneous tissue of the abdomen. The lethal dose is determined as the smallest dose that will kill within six hours. Comparative results were also obtained using Rowe's "white mice" method. More than 1000 guinea-pigs and about 900 mice were used in this study. For stable preparations there was a remarkably good agreement between results of the assays by the two methods. Mice required practically ten times as much tincture or fluidextract to kill as did guinea-pigs. No deterioration was noted when the product contained sufficient acid to maintain the p_H at four or above. When the p_H fell below four deterioration was evidenced by tests upon both types of animals. There was a lesser degree of agreement between results by the mouse and the guinea-pig methods on deteriorating samples and the ratios of M. L. D.'s fell to around 1 to 3. The amount of acid required to produce the desired p_H varied for each sample. It was recommended that a p_H of 2.5 to 3 be produced in order to prevent deterioration. The authors found that 10 per cent to 20 per cent of alcohol in the dose injected into guinea-pigs and mice did not change the ratio of the lethal doses. However, 30 to 40 per cent of alcohol decreased the toxicity on guinea-pigs and increased the toxicity on mice.

May 1927.

Ralph E. Terry: "A study of *ephedra nevadensis*." Pp. 397–407. The diuretic effect following the administration of various preparations of *ephedra nevadensis* was determined by giving fluid and solid extracts and infusions to various human subjects. The infusion is recommended. Slight constipating action was noted following the continued administration of the fluidextract. The alcoholic and chloroformic extracts were uniformly inactive. The diuretic constituent is apparently water soluble.

June 1927.

Georgianna Simmons Gittenger and James C. Munch: "Physiological potency of imported ergot of rye.' Pp. 504–505. Samples from 69 shipments, representing 1100 bags of ergot of rye, have been assayed by the cockscomb method adopted as the official method of assay

in U. S. P. X. Sixty per cent of these shipments were found to be as strong as, or stronger than the U. S. P. X standard fluidextract of ergot; 26 of 27 samples of known Spanish origin were equal to or above the U. S. P. requirement. Six Portugese samples were also in accordance with U. S. P. requirements. Three of 5 samples from Poland and 7 of 9 samples from Russia were below the U. S. P. requirements.

Georgianna Simmons Gittenger and James C. Munch: "The assay of ergot by the cockscomb method." Pp. 505–510. This paper presents various observations in the course of several years study of the cockscomb method for assaying ergot. Varieties of cocks other than white leghorn were found to be unsuitable. Hens were found to be unsuitable. Only 38 per cent of the 190 birds studied had thresholds at 0.5 cc. per Kg. which is specified in the U. S. P. X. The authors point out the necessity for the careful determination of the true threshold of white leghorn cocks to be used. In their experiments the thresholds range from 0.2 cc. up to 2.0 cc. per Kg. By careful attention to details, ergot and its preparations may be satisfactorily assayed by the cockscomb method outlined in U. S. P. X.

L. W. Rowe: "The colorimetric assay of digitalis." Pp. 510–516. The chemical method of assay devised by Baljet and modified by Knudson and Dresbach was applied to about 100 samples of digitalis, digitalin and tincture strophanthus. The M. L. D.'s were determined on the same samples. German digitalin and digitoxin were unsuitable as standards and ouabain was rather unsatisfactory because the rate of development of color was not proportional to that for digitalis. Lowering the ouabain standard from 0.266 mg. per 5 cc. to 0.20 mg. per 5 cc. gave better results. Readings at 15, 20 and 25 minutes after the addition of picric acid reagent gave different results: readings at 20 minutes seemed to be the best. Tincture of strophanthus representing a 1:20 extract was tried as a standard and a 1:70 dilution of this tincture was equivalent to 1:25,000 dilution U. S. P. ouabain. Tincture of strophanthus was found to be most satisfactory as a standard. Rowe concludes that the picric acid colorimetric assay is not a satisfactory method of determining the total activity of digitalis preparations since it yields high and erratic results, and since color tests do not check results obtained by the M. L. D. frog method.

July 1927.

Albert Schneider: "The earth-worm method for testing santonin and related anthelmintics." Pp. 623–627. The author described a modification of the Trendelenburg method of assaying anthelmintics. Results are based on the production of spasmodic contractions rather than upon toxicity.

Lloyd K. Riggs and Harold D. Goulden: "Further studies on the physiologic action of propylene." Pp. 635–639. Electrocardiographical studies on human subjects under propylene anesthesia with electrocardiograph leads 2 and 3. There was a slight reduction in pulse rate with a decrease in sinus arrhythmia. In no experiment was there evidence of a sudden change in rate.

Charles C. Haskell: "The influence of digitalis on the resistance of guinea-pigs to poisoning by diphtheria toxin." Pp. 639–644. Tincture of digitalis does not hasten the death of guinea-pigs that are given diphtheria toxin at the same time. Amounts as large as 60 per cent of the M. L. D. of the tincture of digitalis did not appear to lower the resistance of guinea-pigs to diphtheria toxin. Some synergism seems to exist between diphtheria toxin and digitalis; amounts of digitalis suspension causing death of the guinea-pigs poisoned with diphtheria toxin while controls receiving the same amount of suspension usually recover.

ABSTRACTS FROM CHEMICAL ABSTRACTS.

July 20, 1926.

C. M. Gruber: "Effect of adrenaline upon strips of excised pregnant human uterus." *Endocrinology*, 9, 407–9 (1925).—The action of adrenaline in causing an increased tonus on the muscles of the pregnant uterus is confirmed in experiments on three sampels taken at Caeserian section.

September 20, 1926.

K. K. Chen and W. J. Meek: "The effect of ephedrine on the circulation." *J. Pharmacol.*, 28, 31–57 (1926).—Ephedrine (I) given intravenously in anesthetized dogs in doses of 0.005 to 30 mg. per kg. rises arterial blood pressure, the optimum dose lying between 1 and 10 mg. per Kg. Larger doses usually lower the blood pressure. Repeated intravenous injections of

optimum doses, when given at intervals of 25 min. are not as effective as the first in rising blood pressure in regard to duration and height. Sub-optimum doses, however, when given close together will show a summative effect in elevating pressure. I in stimulating doses (those that rise blood pressure) usually slows the pulse rate in animals with intact vagi. Acceleration always takes place when the vagi are paralyzed by atropine. I in doses that lower the blood pressure always decreases the pulse rate irrespective of the condition of the vagi. Prolonged vasoconstriction is observed in the perfusion of isolated mammalian organs. The action on the heart of I sulphate is discussed.

October 10, 1926.

W. E. Wentz, Jr.: "Toxicity of digitalis to white rats." JOUR. A. PH. A., 14, 774–8 (1925).—A dilution containing 3 volumes of tincture and 1 volume of physiolog. NaCl solution was satisfactory. The M. L. D. intravenously was found to be 0.00395 cc. per Gm. of body weight. All animals fatally poisoned died within 15 minutes after injection. This is much more rapid than the frog (1 hr.) or guinea-pig (2 hrs.). Tincture of digitalis is more toxic to the white rat than to the frog. The toxic dose for the rat and for the guinea-pig are close together. Tincture of strophanthus was more than twice as toxic to rats as the tincture of digitalis. The M. L. D. of EtOH for rats is so near that of tincture of digitalis that further experiments must be conducted to establish the relation of the EtOH present to the M. L. D. of the tincture of digitalis.

D. W. Beddow, Jr.: "Toxicity of strophanthus to white rats." JOUR. A. PH. A., 14, 778–81 (9125).—A tincture of strophanthus was standardized by the 1-hour frog method. The M. L. D. was 0.00006 cc. per Gm. of body weight. The M. L. D. EtOH for white rats was determined to be 0.00345 cc. (of 95%) per Gm. of body weight. The M. L. D. of tincture of strophanthus was 0.0017195 cc. per Gm. of body wt. Calculations showed that the EtOH is responsible for about 50% of this. Rats die within a few minutes after injection. The tincture is 25–30 times as toxic to the frog as it is to the white rat.

October 20, 1926.

F. M. Smith, G. H. Miller and V. C. Graber: "The action of epinephrine, pituitary extract and acetylcholine on the coronary arteries of the rabbit." *Proc. Soc. Exptl. Biol. Med.*, 22, 507–8 (1925).—Epinephrine was injected at a rate to produce a concentration of approx. 1–200,000,000 in the coronary arteries. The perfusion rate decreased 12 to 22.5%; the heart rate and amplitude were increased. Pituitary Extract in concentrations of 1–50,000 caused a striking decrease in perfusion rate and also in heart action. Acetylcholine in dilutions of 1–100,000 and 1–200,000 raised the perfusion rate 180% and greatly reduced the heart rate. The previous administration of atropine sulphate in concentrations of 1–20,000 largely eliminated the effects of subsequent injections of acetylcholine.

November 10, 1926.

S. d'Irsay: "The action of strophanthus on the chloralized heart." *Proc. Soc. Exptl. Biol. Med.*, 22, 530–3 (1925).—The action of a digitalis body is purely myotropic. It has a similar effect on the cold-blooded heart, denervated by chloral hydrate, as it has on the normal organ.

C. H. Thienes: "Effects of Cholesterol on smooth muscle of intestine and uterus." *Proc. Soc. Exptl. Biol. Med.*, 22, 539–41 (1925).—Cholesterol in concn. of 1–5,000,000 in Tyrode solution increased the activity of immersed strips of the intestine and uterus of the cat and rabbit. The effect was due to increased contractility of the muscle substance independent of nerve endings and ganglia.

H. H. Knaus: "The action of pituitary extract upon the pregnant uterus of the rabbit." *J. Physiol.* 61, 383–97 (1926).—Parturition could be induced in rabbits by pituitary extract injected on the 29th to 32nd days of pregnancy. Previous to the 29th day the muscle cells of the uterine wall are probably too underdeveloped to expel the fetus in response to pituitary extract. There is probably no change in irritability or sensitivity of the uterus.

ABSTRACTS FROM THE CANADIAN MEDICAL ASSOCIATION JOURNAL.

December 1926.

F. W. Ward: "The potency of tinctures of digitalis and strophanthus." Samples were taken of the tinctures of digitalis offered for sale by the various manufacturers throughout Canada.

The samples represented those made by British, Canadian and American manufacturers.

An examination of these tables shows that all the samples exhibit great variation in potency throughout the entire lot, and also among the samples of the same manufacturer as sold or dispensed by the local druggist.

The tables show that the variation is just as great in those samples from manufacturers in the United States and Great Britain as in those made in Canada.

A study of the tables shows that if a physician wishes to obtain a potent tincture of either digitalis or strophanthus, he must purchase the tincture of a reliable manufacturer; that he must purchase the tincture in its original sealed container and that the tincture must be of recent manufacture and be from a manufacturer who carries out a physiological standardization of his product.

ABSTRACTS FROM THE JOURNAL OF PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS.

December 1926.

Charles M. Gruber: "The influence of barbituric acid, of some benzyl derivatives and of the p_H of fluids on the tonus and rhythmic movements of excised segments of intestine, uterus and ureters." All barbituric acid derivatives tested caused loss of tonus of the excised strips of intestine, uterus and ureters.

Sodium benzyl succinate and sodium dibenzyl phosphate although possessing some tonus relaxing properties are not as effective as the barbituric acid derivatives.

Change in p_H of the fluid bathing the tissue is an important factor in the response of the tissue to drugs and must be considered in studying the action of drugs upon all excised strips of tissue.

Decreased p_H of the fluid bathing the strips of intestine, uterus and ureters causes a lowered tonus and may cause it to disappear entirely. Increasing the p_H results in heightened tonus of these same tissues.

February 1927.

A. McFarlane and G. A. Masson: "On the standardization of digitalis by the cat unit method." A large body of experiments on the assay of digitalis by the cat unit method as modified by Magnus from that of Hatcher is recorded.

It is pointed out that the results vary to a considerable extent, there being a relatively larger number of high results than are obtained by other observers. By means of group frequency curves it is shown that there are probably two groups of cats being dealt with, the high results belonging to a small and appparently distinct group with a greater resistance to the drug.

April 1927.

J. Ernest Nadler: "A quantitative comparison and toxicological study of ephedrine and epinephrine." A method is described for the study of the action and antagonism of drugs on the smooth muscle and the nervous control of melanophores of squid.

Both ephedrine and epinephrine can antagonize the action of $BaCl_2$ and the extracts of the parathyroid and the anterior and posterior lobes of the pituitary gland.

Epinephrine is about 20 times as effective as ephedrine in antagonizing the action of the extracts of the parathyroid and the anterior pituitary gland, twice as effective in antagonizing the action of the extract of posterior lobe of the pituitary gland. Ephedrine is almost 10 times more effective than epinephrine in antagonizing $BaCl_2$.

June 1927.

F. R. Winton: "The rat-poisoning substance in red squills." Red squill preparations, administered per os to rats, induce convulsions and paralysis. There is no diarrhea, and an action on the circulation adds no significant contribution to the fatal result.

The technique of quantitative estimations of toxicity is discussed.

The rat-poisoning substance in red squills is relatively thermostable, soluble in water and in concentrations of alcohol and acetone up to 90 per cent. It is destroyed by boiling with dilute acid or alkali. It can be kept for long periods without appreciable deterioration.

July 1927.

Louis E. Martin: "A clinical standardization of digitalis." It was possible in a series of 19 cases of myocardial insufficiency treated with three preparations of dried powdered digitalis leaves to determine the relative potency of each by clinical methods.

These relative potencies compared favorably with results obtained by biological methods.

Dried powdered digitalis leaf is advocated because it is stable and easy to administer in uniform doses.

Digitalis may be given rapidly and should be given in considerable quantity until evidence of therapeutic effect is apparent and then continued at a rate approximately equal to the rate of excretion.

ABSTRACTS FROM AMERICAN JOURNAL OF PHARMACY.

Leonard and Heacock: "Testing germicidal power of certain products," Vol. 99, p. 335 (1927).—The authors describe a method, which is a modification of the Hygienic Laboratory Phenol Coefficient Test. In place of the *Bacillus typhosus* the strain of *staphylococcus aureus* is used. The authors describe method of making medium and an outline of procedure, and an example of an average test for determination of the germicidal strength as compared to phenol.

Burn: "Some methods of biological assay," Vol. 98, p. 657 (1926).—The author reviews and describes methods of biological testing, Houghton's Frog Method, Hatcher's Cat Method, Assay of Ergot, Testing of Ovarian Extract and Gland Therapy.

Charles L. Wible: "A comparison of methods of digitalis standarization," Vol. 98, p. 396 (1926).—A comparative assay of digitalis preparations made from *purpurea* and *lutea* by three methods—the official Frog Method, Hatcher's Cat Method and Knudson's and Dresbach's Colormetric Method. The biological methods agree within the limits of biological error. The colorimetric method did not parallel the biological methods. The figures obtained by the colorimetric method indicate greater activity for each preparation than do our biological assay, they do not establish a constant ratio between the results of the colorimetric and biological methods. The assay of ten commercial tinctures of supposedly uniform strength (65 mgm. = 1 c. u.) shows an activity ranging from 53 mgm. to 100 mgm. per c. u.

PAUL S. PITTENGER, *Chairman.* D. I. MACHT,
W. A. PEARSON, E. E. SWANSON,
L. W. ROWE, J. C. MUNCH.

THE PHARMACEUTICAL SYLLABUS COMMITTEE—BULLETIN II.

Copies of the third edition of the Syllabus, to be used in connection with the work of revision, will be sent to members, on request.

A copy of the two-page supplement to the third edition of the Syllabus, giving a suggested general outline of the three-year minimum course in pharmacy, is enclosed for careful consideration, as some general topics connected with this outline, on which a tentative understanding must be reached soon, are submitted for consideration in this Bulletin.

It will help us to avoid misunderstanding if the origin, duties and powers of the Committee are clearly understood by all regular and associate members and are kept in mind during the progress of the work.

The Committee is made up of twenty-one members, one member being appointed each year for a seven-year term by each of the following three national organizations: THE AMERICAN PHARMACEUTICAL ASSOCIATION, The American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy. The duty of the Committee is to prepare and publish the Pharmaceutical Syllabus, outlining the minimum course in pharmacy, within the general requirements adopted by the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy, with such additional matter as is deemed advisable. While the Committee is a self-governing body, it must keep within its limitations. It should be remembered that the Syllabus is suggestive, not obligatory, and it tries to assist the colleges and boards of pharmacy in their work, not to rule them. Schools are at liberty to exceed the requirements,

either in the time devoted to subjects in the Syllabus or by the addition of other subjects to their curriculums.

The first subject for consideration is the question of the possible omission of any subjects now included in the Syllabus. For instance: Elementary physics is taught in high schools and is now among the subjects required for entrance to many colleges of pharmacy. Is it necessary or desirable to continue this subject in the Syllabus? Members are requested to critically examine the list of subjects given in the enclosed supplementary pages and to send the Chairman their views on the possible omission of physics and any others from the list.

It is also necessary for us to determine what additional subjects are to be included in the minimum course. The Charters report includes several subjects which are not now included in the Syllabus, some of which can well be combined with subjects already included, like public health (hygiene) with physiology, a standard combination. Others which it will be profitable to include, are the pharmaceutical aspects of bacteriology, immunology, biological assaying and gland therapy. While the average pharmacist does not require a working knowledge of these subjects, he should have a general knowledge of them, to enable him to understand some modern developments in pharmacy.

A very interesting short section of the Charters report is entitled "Professional Morale." This includes vocational guidance, the history of pharmacy, responsibilities of the pharmacist, personality of the pharmacist, research in pharmacy and other sub-topics. Will it be well to include such a subject in the course, and, if so, in which year?

Suggestions for other subjects that might be added to the course are requested, but it should be remembered that time for subjects added must be taken from the time of those already included, to keep within the total number of hours in the minimum course.

Regular and associate members are requested to consider these matters carefully and to send suggestions on them to the Chairman. Later, a revised general program for the three-year course will be submitted for criticism.

Other general topics will be submitted for consideration in later bulletins, with concrete questions for decision, as they arise.

Respectfully submitted, T. J. BRADLEY, *Chairman.*

COMMITTEE ON BIOLOGICAL PRODUCTS.

The following letter has been addressed to all schools and colleges of pharmacy by Samuel S. Dworkin, Chairman of the Committee on Biological Products.

Dear Dean:

At the meeting of THE AMERICAN PHARMACEUTICAL ASSOCIATION held last August at St. Louis, a resolution was adopted authorizing the Committee on Biological Products to secure dummy packages of various biologicals and make them available to the Colleges of Pharmacy for lecture demonstration.

The Chairman of the Committee on Biological Products has arranged to supply representative sets of water-filled biological packages to all of the Colleges of Pharmacy in the United States.

The Committee feels that by having available the various types of biological products containers, such as ampuls, syringes, etc., the lecturer will be in a position to supplement his instruction with practical demonstrations which will be interesting to his classses and which will acquaint them not only with the appearance of the containers but with the technique employed in administering their content.

The Committee is hopeful that students receiving this type of instruction will, through the intimate knowledge thus gained, handle biological products with a feeling of keen interest, appreciation and confidence when, as registered pharmacists, they are brought into close professional relations with physicians.

If you will write to me at your earliest convenience, stating that you will accept this service for use at your college, a complete set of the biological packages will then be forwarded to you without cost and with delivery charges prepaid.

SAMUEL S. DWORKIN, *Chairman,*
Committee on Biological Products.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1927–1928.

Office of the Secretary, 10 West Chase St., Baltimore, Md.

LETTER NO. 5.

December 30, 1927.

To the Members of the Council:

46. Retail Selling Price of the N. F. V in Canada. Motion No. 7 (See Council Letter No. 3, page 1117) has been carried and $4.00 has, therefore, been set as the retail selling price of the N. F. V in Canada.

47. Motion No. 11 (See Council Letter No. 4, page 1210) has been carried and the appropriation for the Headquarters Building Campaign for 1927 has been increased to $9000.00.

48. Selection of Auditors. Motion No. 12 (See Council Letter No. 4, page 1210) has been carried and W. A. Johnson & Co. will be employed to audit the accounts of the ASSOCIATION for 1927.

49. Election of Members. Motion No. 14 (See Council Letter No. 4, page 1212) and *Motion No. 15* (See Council Letter No. 4, page 1216) have been carried and applicants for membership Nos. 40 to 85 inclusive, and applicants for membership No. H-39 to H-339 inclusive are declared elected.

50. Award of the Contract for Printing and Mailing the JOURNAL for 1928. The following communication has been received from Chairman DuMez of the Committee on Publications:

> "Bids on the printing and mailing of the JOURNAL have been received from several firms. These have had careful consideration and it is the recommendation of the Committee and of the Editor of the JOURNAL that the contract for printing and mailing the JOURNAL for 1928 be awarded to the Mack Printing Company of Easton, Pa., which firm has printed the JOURNAL for several years past. The Committee is pleased to report that the bid of this firm is the same as for 1927.

(*Motion No. 16.*) *It is moved by DuMez that the contract for printing the Journal for 1928 be awarded to the Mack Printing Company of Easton, Pa.* By request of Chairman DuMez, a vote is called for at this time, but it will be considered as tentative if there is objection.

51. Award of the Contract for the Manufacture and Distribution of the Year Book, Volume 15, for 1926. The following communication has been received from Chairman DuMez of the Committee on Publications:

> "Bids on the Manufacture and Distribution of the Year Book, Volume 15, for 1926 were received from the firms which bid on Volume 14, and as the bid of the Lord Baltimore Press, Baltimore, Md. is considerably lower than the contract for Volume 14, it seemed that they should be given every opportunity to secure the contract, provided they were properly equipped to do the work and that they were not merely submitting a low estimate to get the job in hand with a view of raising the price on the next volume. Your Chairman, therefore, visited their plant, which is located in Baltimore, talked with the officials who would have charge of the work, and is convinced that they are not only well equipped to do the job, but that they are making an honest and sincere effort to get the work.
>
> "It is, therefore, the recommendation of the Committee and of the Editor of the Year Book that the contract for the manufacture and distribution of the Year Book, Volume 15, for 1926 be awarded to the Lord Baltimore Press, Baltimore, Md."

(*Motion No. 17.*) *It is moved by DuMez that the Contract for Printing and Mailing Volume 15 of the Year Book be awarded to the Lord Baltimore Press, Baltimore, Md.*

52. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 86, Neal Ainsworth, 800 Grant St., Amarillo, Tex.; No. 87, Miriam Berman, 2515 N. Corlies St., Philadelphia, Pa.; No. 88, Louis D. Bracken, Pantages Theatre Building, Seattle, Wash.; No. 89, W. Lee Campbell, % Chas. H. Hitchcock, Inc., 999 Beacon St., Brookline, Mass.; No. 90, S. Y. Chen, 527 W.

124th St., New York, N. Y.; No. 91, Russell Robb Frew, 313 College Ave., Pullman, Wash.; No. 92, G. P. Groom, Enger-Kress Pocket Book Co., West Bend, Wis.; No. 93, Joseph F. Huber, Prophylactic Brush Co., Florence, Mass.; No. 94, Harry Keilin, 578 East 161st St., New York, N. Y.; No. 95, Frederick Kleinschmidt, 199 North 12th St., Newark, N. J.; No. 96, Leonard J. Leininger, 4250 No. Crawford Ave., Chicago, Ill.; No. 97, Fred Ludwig, 5401 So. Union Ave., South Tacoma, Wash.; No. 98, Emily H. McCurdy, University of Tennessee, College of Pharmacy, Memphis, Tenn.; No. 99, Elizabeth B. McKean, 79 East 130th St., New York, N. Y.; No. 100, Victor Grove Mercer, W. Patrick St. Extd., Frederick, Md.; No. 101, E. L. Michaels, 50–60 First St., San Francisco, Cal.; No. 102, James Morrison, 1401 Nicholas Bldg., Toledo, Ohio; No. 103, Philip A. Rising, 444 W. Grand Ave., Chicago, Ill.; No. 104, Thomas F. Rylands, 1463 East 70th St., Chicago, Ill.; No. 105, Alim Shapiro, 2631 McKinley Ave., Milwaukee, Wis.; No. 106, George F. Shaw, 426 Fairmount Ave., Philadelphia, Pa.; No. 107, Carroll Dunham Smith, 317–323 East 34th St., New York, N. Y.; No. 108, Willie Leisse Stephen, 900 Wilson Ave., Chicago, Ill.; No. 109, Frank Weimar Suhrer, 1325 E. Mallory St., Pensacola, Fla.; No. 110, Lucien J. Trudel, 47 Center St., Rutland, Vt.; No. 111, Thomas A. Watson, 1156 N. Crawford Ave., Chicago, Ill.

(*Motion No. 18.*) Vote on applications for active membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

53. Applicants for Membership on Account of Contributions to the Headquarters Building Fund. The following non-members of the A. PH. A. have pledged $25.00 or more to the Headquarters Building Fund and have made a cash payment of $5.00 or more. They are entitled to membership and you are requested to vote on the applications which have been properly endorsed.

H-340, James Adams Alexander, 411 S. Nineteenth St., Paducah, Ky.; H-341, Hamilton Aley, 134 N. Tejon St., Colorado Springs, Colo.; H-342, Raymond J. Ambrose, 402 Castro St., Oakland, Calif.; H-343, Norbert Apt., 451—15th St., Brooklyn, N. Y.; H-344, Carl Axelberg, 1432 East Superior St., Duluth, Minn.; H-345, Otto Barth, 1040 27th St., Milwaukee, Wis.; H-346, Guy Adrain Bailey, 3102—11th St., Gulfport, Miss.; H-347, Lula Mae Barkley, 11th Army Post, Des Moines, Iowa; H-348, Angelo Bartolomeo, 347 36th St., Brooklyn, N. Y.; H-349, Angelo Filbert Basilone, 602 Highland Ave., Connellsville, Pa.; H-350, Swerr W. Belanger, 2703 Montana Ave., Billings, Mont.; H-351, Leo Bigotti, 728—2nd Ave., New York, N. Y.; H-352, James Billings, 121 No. Main St., Blackwell, Okla.; H-353, Ivory H. Blasingame, 1637 Ionia St., Jacksonville, Fla.; H-354, Henry Burke Boleman, 255 Greenwich St., Valparaiso, Ind.; H-355, Preston Alton Booker, 48 Vine St., New Bedford, Mass.; H-356, Joseph Breslow, 158 N. Concord St., So. St. Paul, Minn.; H-357, Jacques Fulton Briceland, R. R. No. 6, Davenport, Iowa; H-358, Jack Brown, Tyler, Texas; H-359, Solomon Brussell, 2059 Davidson Ave., Bronx, N. Y.; H-360, Ethan Allen Burford, 133 S. Hotel St., Honolulu, T. H.; H-361, Benson Keith Burke, Route 1, St. Matthews, S. C.; H-362, Charles T. Capute, 430 Grand Ave., Astoria, L. I. City, N. Y.; H-363, Robert Francis Coleman, 1709 Opal St., Pullman, Wash.; H-364, Millie Coler, 312 Grant Ave., Norton, Kans.; H-365, Ercole Conte, 123 Park Place, Schenectady, N. Y.; H-366, Oscar E. Cooperman, 915 Newton Ave., No., Minneapolis, Minn.; H-367, John Corso, 431 Park Ave., East Orange, N. J.; H-368, Claude C. Cowden, 6 Kron St., Evansville, Minn.; H-369, Arthur Guy Croft, Box 34, Boise, Idaho; H-370, Harold Bartley Crosby, 764 So. Los Robles Ave., Pasadena, Calif.; H-371, Albert Colcord Deen, Jr., Quitman, Ga.; H-372, E. De Mari, 166 Hester St., Cor. Mott St., New York, N. Y.; H-373, Henry A. Diebold, 624 Calhoun St., Ft. Wayne, Ind.; H-374, James D. Dow, 66½ Beacon St., Boston, Mass.; H-375, Bertis Edwin Downs, Jr., 183 Virginia Ave., Welch, W. Va.; H-376, Louis Arend Dreyer, Aplington, Iowa; H-377, Ralph Harrison Easton, Tioga, N. Dak.; H-378, Victor Hugo Edelstern, 62 East 94th St., New York, N. Y.; H-379, Einard John Edfors, 153 S. 15th Ave., Maywood, Ill.; H-380, Charles B. Edwards 1535 Spruce St., Berkeley, Calif.; H-381, Waldo Phillip Edwardson, 3413 Oakland Ave., So., Minneapolis, Minn.; H-382, Walter Alexander Elliott, 6208 Langley Ave., Chicago, Ill.; H-383, Edwin Everett, Atkinson, Ill.; H-384, Jesse C. Fegley, 7 Parsells Ave., Rochester, N. Y.; H-385, John H. Finn, Jr., 461 Spring St., Newport, R. I.; H-386, Albert Waldo Fredell, 930 Earl St., St. Paul, Minn.; H-387, Walter George Fredell, 930 Earl St., St. Paul, Minn.; H-388, Don S. Freiday,

% Suman Drug Co., Cushing, Okla.; H-389, Charles F. Griffin, 319 Main St., Mapleton, Iowa; H-390, Anthony Nicholas Haag, 1644 Union St., Indianapolis, Ind.; H-391, Harriet C. Hallenberg, 105—4th Ave. S. W., Moorhead, Minn.; H-392, Thomas D. Halliday, 8th & Pearl Sts., Jacksonville, Fla.; H-393, Einar L. Hansen, 78 Manhattan Ave., Avenel, N. J.; H-394, Olin D. Harris, R. F. D. No. 10, Lawrence, Kans.; H-395, William Frederick Heidenreich, Jr., Smithfield & Water Sts., Pittsburgh, Pa.; H-396, Isidore Heifler, 660 Washington Ave., Brooklyn, N. Y.; H-397, James Leonard Hicks, Jr., 823 6th Ave., Laurel, Miss.; H-398, Worthy Travis Hilliard, Milano, Texas; H-399, Jane Ester Hinkley, Harding, Mass.; H-400, W. D. Howell, Dardanelle, Ark.; H-401, Herman Francis Huttemeyer, 17 Nelson Ave., Jersey City, N. J.; H-402, Benjamin Itzkowitz, 420 E. 8th St., New York, N. Y.; H-403, Harry A. Jackson, 402 E. State St., Rockford, Ill.; H-404, Ethel May James, 724 North 22nd St., Lincoln, Nebr.; H-405, Ackland H. Jones, Jr., Woodville, Miss.; H-406, Julius Kaplan, 1382 College Ave., Bronx, N. Y.; H-407, Isidore Kapp, 624 Hudson St., New York, N. Y.; H-408, Aaron Katz, 3802—12th Ave., Brooklyn, N. Y.; H-409, Edward Kraft, 200 Lincoln Ave., Evansville, Ind.; H-410, Harry J. Krasneski, 6333 S. Green St., Chicago, Ill.; H-411, Joseph Johns Leavitt, Youngston, Nev.; H-412, Fred Lebr, Rockdale, Texas; H-413, Donald William Leik, 501 Rhomberg Ave., Dubuque, Iowa; H-414, Charles O. Lepper, 2224 Crescent Ave., Ft. Wayne, Ind.; H-415, Hyman Lesser, 2957 N. Kedzie Ave., Chicago, Ill.; H-416, G. L. Lilly, 1328 Myrtle Ave., Cor. Kings Rd., Jacksonville, Fla.; H-417, Lysander Smith Logan, 3712 Santa Rita St., Oakland, Calif.; H-418, Henry M. Manning, 711 Redgate Ave., Norfolk, Va.; H-419, Percy McClellan, Park City, Utah; H-420; Henry Clay McCulloh, Piedmont, W. Va., H-421, Florence Eleanor McDonald, Hawley, Minn.; H-422, Henry Charles McQuire, 7736 Suffolk Ave., Webster Groves, Miss.; H-423, Francis Gilbert Messier, 201 Winthrop St., Winthrop, Mass.; H-424, Walter William Meyer, 509 Lincolnway, Laporte, Ind.; H-425, Elsa Helen Meyers, 95 So. 7th St., Minneapolis, Minn.; H-426, Clifford Robert Mileham 492 Linden Ave., East Aurora, N. Y.; H-427, James Monroe Miller, Elizabeth St., Vacaville, Calif.; H-428, Ernest J. Monteleone, 111 Clinton Ave., Jersey City, N. J.; H-429, Willard H. Moyer, Huntley, Mont.; H-430, Julius William Neubauer, 421 W. McMicken Ave., Cincinnati, Ohio; H-431, Henry J. Neuman, 4805 Bliss Street, Woodside, Long Island, N. Y.; H-432, H. E. Newman, 615 Codey Ave., Norfolk, Va.; H-433, George F. Obert, 14303 Triskett Rd., Cleveland, Ohio; H-434, Alviron Overbye, Fairdale, N. Dak.; H-435, M. Palis, 70 East Quackenbush Ave., Dumont, N. J.; H-436, E. R. M. Pecoraro, 751 E. 187 St., Bronx, N. Y.; H-437, J. B. Pendergrast, 420 Moreland Ave. N. E., Atlanta, Ga.; H-438, Donald L. Price, Arlington, Ind.; H-439, William Albert Price, 238 Mills Ave., Flemingsburg, Ky.; H-440, Maynard W. Quimby, 14 Ivy St., Suite 212, Boston, Mass.; H-441, Richard P. Reimann, Sag Harbor, L. I., N. Y.; H-442, Miles E. Riggs, 232 North Main St., Cheboygan, Mich.; H-443, Merrill D. Roberts, 901 Hennepin Ave., Minneapolis, Minn.; H-444, Virginious Orville Robertson, Jr., 1516 Sixteenth St., Lynchburg, Va.; H-445, Joseph Dominick Romino, 204 Pennsylvania Ave., Fairmont, W. Va.; H-446, Max Rosenblum, 1976—2nd Ave., New York, N. Y.; H-447, Louis Rosenzweigh, 1211 Boston Road Cor. 168th St., New York, N. Y.; H-448 Jacob Sarawaisky, 20 Bergen Place, Jamaica, L. I., N. Y.; H-449, Gordon Richard Satterberg, 1367—3rd Ave., San Francisco, Calif.; H-450, John W. Schneider, 628 E. Eager St., Baltimore, Md.; H-451, Marvin Schneider, Wheatland, Iowa; H-452, William Henry Schopmann, 103 Grace St., Jersey City, N. J.; H-453, John Schubert, 812 Sixth Ave., So., Great Falls, Mont.; H-454, Edmund F. Schwankl, Richmond, Minn.; H-455, Nathan Seltzer, 196 New Lots Ave., Brooklyn, N. Y.; H-456, George A. Seyfarth, 3510 Lincoln Ave., Chicago, Ill.; H-457, Charles Shavel, 285 Columbia St., Brooklyn, N. Y.; H-458, Ernest Thompson Shiver, 220 S. Lee St., Front Royal, Va.; H-459, Albert G. Schmidt, 63 W. Main St., Springfield, Ohio; H-460, Chas. L. Smith, Kearney, Mo.; H-461, Charles Abraham Solomon, 1359 Lyman Place, Bronx, N. Y.; H-462, Samuel Solosko, 355 Crimmins Ave., Bronx, N. Y.; H-463, Curtis E. Sommer, Barnesville, Minn.; H-464, E. P. Southwick, 565 Miller Ave., Clairton, Pa.; H-465, Winford Earl Sowersby, 416 Highland Ave., Mount Vernon, N. Y.; H-466, Paul E. Stockard, 129 West Main St., Walla Walla, Wash.; H-467, Alexander D. Tchalovsky, 208 South St., W. Lafayette, Ind.; H-468,

Oscar E. Teuteberg, 2836 Chouteau Ave., St. Louis, Mo.; H-469, Robert W. Thygeson, 1546 S. St., Lincoln, Nebr.; H-470, William Jones Tidwell, Malone, Fla.; H-471, Jas. G. Timolat, 59 Fourth Ave., New York. N. Y.; H-472, George Lewis Traver, 460 Oliver St., N. Tonawanda, N. Y.; H-473, Saul Omar Unterman, 158 East 96th St., Brooklyn, N. Y.; H-474, Rudolph Vertiska, Humboldt, Nebr.; H-475, William James Wakeman, 707 N. 58th Ave. W., West Duluth, Minn.; H-476, August William Weinberger, Lakota, Iowa; H-477, L. Z. Weiss, 143 W. Front St., Plainfield, N. J.; H-478, Walter R. Weller, 329 Coppeii Ave., Waitsburg, Wash.; H-479, Harry A. Whitton, 1301 S. E. 4th St., Minneapolis, Minn.; H-480, Alf. Whitworth, P. O. Box 436, Deer Lodge, Mont.; H-481, Louis E. Will, 2425 North Ave., Milwaukee, Wis.; H-482, George A. Williams, 1061 W. State St., Rockford, Ill.; H-483, Washington William Winberg, 400 Linden Ave., Wilmette, Ill.; H-484, Albert G. Winter, 3453 Division St., Los Angeles, Calif.; H-485, Frank A. Wittenberg, 8th & Overton Sts., Newport, Ky.; H-486, Richard Edwards Wina, Dodge, Nebr.; H-487, A. J. Wolf, 706 Oakland Ave., Milwaukee, Wis.; H-488, Lowell W. Yankie, 2617 Vine St., Cincinnati, Ohio; H-489, Grace Youngberg, 1157 Crystal Ave., Salt Lake City, Utah; H-490, Arthur A. Zandee, 157 Hemenway St., Boston, Mass.; H-491, Edward Joseph Zapp, 1223 S. Shelley St., Louisville, Ky.

(*Motion No. 19.*) Vote on applications of contributors to the Headquarters Building Fund for Membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

51. Budget for 1928. The Committee on Finance, through its Acting-Chairman, presents to the Council the following list of appropriations to cover the various expenditures of the ensuing fiscal year, in accordance with Article II of Chapter II of the By-Laws of the Council.

APPROPRIATIONS FOR GENERAL EXPENSES.

No. 1 Salaries	$11,700.00
No. 2 Rent	1,020.00
No. 3 Telegraph & Telephone	150.00
No. 4 Clerical Expenses	1,400.00
No. 5 Printing, Postage & Stationery	1,200.00
No. 6 Office Supplies	100.00
No. 7 Traveling Expenses	1,000.00
No. 8 Stenographic Report of Meetings	350.00
No. 9 Premium on Bonds	60.00
No. 10 Auditing	75.00
No. 11 Certificates	50.00
No. 12 Miscellaneous Expenses	150.00
No. 13 Scientific Section	25.00
No. 14 Section on Education & Legislation	25.00
No. 15 Section on Practical Pharmacy & Dispensing	25.00
No. 16 Section on Commercial Interests	25.00
No. 17 Section on Historical Pharmacy	25.00
No. 18 Commission on Proprietary Medicines	50.00
No. 19 Committee on Local Branches	25.00
No. 20 Committee on Membership	1,000.00
No. 21 Committee on State & National Legislation	100.00
No. 22 Committee on Syllabus	50.00
No. 23 Committee on Standards of Drugs & Chem. Prod.	50.00
No. 24 Committee on Colored Glass Containers	50.00
No. 25 National Drug Trade Conference	200.00
No. 26 Drug Trade Bureau of Public Information	400.00
No. 27 International Pharmaceutical Federation	120.00
No. 28 Metric Association	10.00
No. 29 American Conference on Hospital Service	25.00
No. 30 Survey of Commercial Pharmacy	500.00
No. 31 Expenses Chairman House of Delegates	100.00
No. 32 Headquarters Building Campaign	6,000.00
No. 33 Year Book	4,500.00
No. 34 Library	100.00
	30,660.00

APPROPRIATIONS FOR OPEN ACCOUNTS.

No. 35 JOURNAL		
(*a*) Publication	$9,500.00	
(*b*) Clerical Expenses	1,000.00	
(*c*) Postage & Stationery	300.00	
(*d*) Freight, Drayage & Miscell.	200.00	11,000.00
No. 36 National Formulary		1,000.00
No. 37 Recipe Book		1,000.00
No. 38 Badges & Bars		50.00

$30,660.00	13,050.00
13,050.00	
43,710.00	

(*Motion No. 20.*) It is moved by Day that the Budget for 1928 as submitted be approved.

E. F. KELLY, *Secretary.*

HEARING ON PUBLIC HEALTH BILL.

Representatives of various organizations interested in public health appeared recently before the Sub-committee of the House Committee on Interstate and Foreign Commerce to present their views on the Parker Bill (H. R. 5766), to provide for the coördination of the public health activities of the Government.

The witnesses stated that the general features of the bill were acceptable, but expressed opposition to the first two sections, providing that the President, by executive order, is authorized to transfer to the Public Health Service "all or any part of any executive agency (other than an agency of the military or naval forces, the War Department, the Navy Department, or the United States Veterans' Bureau) engaged in carrying on public health acitivity." The second section provides that the President be authorized to direct that officers or employees of the Public Health Service "shall be detailed to any other executive agency which is carrying on a public health activity, in order to supervise or coöperate in such work."

Those who appeared before the Committee were A. M. Loomis, of the American Dairy Federation; C. W. Holman, Secretary, National Coöperative Milk Producers; H. B. Thompson, of Proprietary Drug Association; H. B. Anderson, Citizen's Medical Reference Bureau, New York; Carson P. Frailey, Secretary, American Drug Manufacturing Association; Eugene C. Brockmeyer, National Association of Retail Druggists; S. M. Shoemaker, Baltimore; W. C. Campbell, Director of Regulatory Work, Department of Agriculture; Dr. A. T. McCormick, State Health Officer of Kentucky; E. Fullerton Cook, Chairman, Revision Committee, U. S. Pharmacopœia, Philadelphia; E. F. Kelly, Secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION, and Representative Hudspeth (Dem.), El Paso, Tex.

The Chairman of the Sub-committee, Representative Mapes (Rep.), of Michigan, declared at the close of the Hearing that the Sub-committee favored the elimination of Section 1 of the bill, and modification of Section 2 so that officers of the Public Health Service may be, by Executive order, detailed to any other executive agency which is carrying on a Public Health activity upon the request of the executive having such activity in charge.

Those representing pharmacy requested that the bill be so amended as to provide that pharmacists of the Public Health Service shall be eligible to receive commissions, after examination, in the same manner as provided for medical and dental officers, for sanitary engineers and for other scientists. The representatives of pharmacy were very pleased by Surgeon-General Cumming's approval of this request, and they were encouraged to believe that this very fitting recognition of pharmacy would be incorporated in the final legislation. If so, the Parker Bill should then have the united and strong support of pharmacists not only because of the recognition of pharmacy but also because this legislation will open the way for the proper solution of the long standing question of the status of all pharmacists in the Government service.

A NEW ANTISEPTIC MARKETED IN GREAT BRITAIN.

A statement by Sir Alfred Mond, as reported in a recent issue of *Chemistry and Industry* (London) called attention to a new antiseptic, "Monsol," which he said was derived from the products of coal tar. Sir Arthur Slogett, who was Director-General of the Army Medical Service in the War, is also quoted to have said that this new product was nonpoisonous and had extraordinary germicidal power. It was thought that the antiseptic would be exceptionally useful in veterinary work.

Two scientists in the United States Bureau of Animal Industry, Schaffer and Tilley, have recently reported the results of their investigations of the bactericidal values of a number of related chemical compounds. They found that a definite numerical relationship—nearly a geometrical progression—exists between the coefficients of members of certain homologous series. One compound, nonylresorcinol, exhibited, when tested against the *staphylococcus aureus* organism, a bactericidal efficiency 1000 times that of phenol.

EDITORIAL NOTES

Editor: E. G. EBERLE, 10 West Chase St., Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, GEO. M. BERINGER, H. C. CHRISTENSEN, J. A. KOCH, J. H. BEAL, W. B. DAY, T. J. BRADLEY. *Ex-Officio Members:* C. W. JOHNSON, *President;* AMBROSE HUNSBERGER, JOSEPH JACOBS, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* LEONARD SELTZER, *Chairman of the House of Delegates.*

Collaborators: The Members of the Council; E. FULLERTON COOK, *Chairman,* U. S. P. Revision Committee; W. L. SCOVILLE, *Chairman,* N. F. Revision Committee; the Chairmen of the Sections, A. PH. A.; L. W. ROWE, M. N. FORD, ADLEY B. NICHOLS, C. LEONARD O'CONNELL, W. P. PORTERFIELD; EDWARD SPEASE, *President,* A. A. C. P.; CHARLES B. JORDAN, *Chairman,* Executive Committee, A. A. C. P.; A. C. TAYLOR, *President,* N. A. B. P.; HENRY C. CHRISTENSEN, *Secretary,* N. A. B. P.

COÖPERATIVE LIBRARIES.

German publishers, voluntarily, are creating a 10,000,000-volume collection of books at Leipsic. In the United States the copyright law automatically builds up the Library of Congress, for with each application for copyright two copies of the books must be deposited. A movement is on foot looking toward coöperation of libraries in an intranational and international way.

The resources of the libraries, according to the Commissioner on Education, Dr. John J. Tigert, are to be distributed through a system of inter-library loans to readers and investigators in all parts of the U. S. and other countries. The Commissioner said that library coöperation pervades all civilized lands.

The American Library Association is an international organization drawing its membership from both the United States and Canada.

The Harvard dean of the Faculty of Arts and Sciences, Dr. Clifford H. Moore, has announced an experiment which he considers the most important undertaking at Harvard since establishing the tutorial system and the general final examinations. In the fortnight immediately following the Christmas vacation there will be no formal teaching by lectures or tutorial conferences except in courses designed especially for freshmen and such others as departments may determine. These periods which are called reading periods, will be given to assigned reading (or laboratory work) to be done by the student without assistance from tutor or lecturer.

We are making these references believing that publishers and authors will be glad to coöperate with the AMERICAN PHARMACEUTICAL ASSOCIATION in establishing its library when the Headquarters is established in Washington. Such coöperation will not only be of benefit to the members of the ASSOCIATION but also to the publishers and authors.

SYMPOSIUM ON THE GENUS MENTHA.

On August 26, 1927, there was held at the St. Louis meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION an informal symposium on the Genus Mentha. This meeting was the idea of Prof. Anton Hogstad and those taking part were:

Edward Kremers, Madison, Wis.; H. W. Youngken, Boston, Mass.; C. M. Sterling, Lawrence, Kans.; Charles C. Plitt Baltimore, Md.; Anton Hogstad, St. Louis, Mo.; C. K. Glycart, Chicago, Ill.; A. J. Swartz, Chilton, Wis.; Leonard Swartz, Inspector of Drugs at the port of New York; G. A. Russell, Greensboro, N. C.

The idea of holding this Symposium was to get together the men interested in mints and to discuss in an informal way, some of the various phases related to the botanical, chemical and commercial sides of the subject. The meeting was productive of so much value that it was decided to hold a similar meeting at Poland Springs, Me., next fall.

One of the main points brought out at the St. Louis meeting, was that through these meetings a line of research on mints can be developed, having a very practical trend. Dr. Kremers especially pointed out how through the coöperation of a large producer of American mint oil, his researches had been of value to all concerned.

At the next meeting, it is planned to have present representatives of mint farmers, and dealers in mint oil.

At the suggestion of those in attendance at the St. Louis meeting, G. A. Russell was delegated to the chairmanship of the coming meeting.

NEW AND NONOFFICIAL REMEDIES.

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to new and nonofficial remedies. A copy of the rules on which the Council bases its action will be sent on application.

W. A. PUCKNER, *Secretary.*

EPHEDRINE HYDROCHLORIDE (See JOUR. A. M. A. March 19, 1927, p. 925).

Ephedrine Hydrochloride-Pemco.—A brand of ephedrine hydrochloride-N. N. R.

Prophylacto Manufacturing Co., Chicago, distributor. No U. S. patent or trademark.

EPHEDRINE SULPHATE (See JOUR. A. M. A., March 19, 1927, p. 925).

Ephedrine Sulphate-P. D. & Co.—A brand of ephedrine sulphate-N. N. R.

Manufactured by Parke, Davis & Company, Detroit. No U. S. patent or trademark.

COD-LIVER OIL (See New and Nonofficial Remedies, 1927, p. 119).

Nason's Palatable Cod-Liver Oil.—Cod-liver oil containing 0.62 per cent of essential oils as flavoring, having a vitamin-A potency such that 0.002 Gm. per day is adequate to promote the growth of young albino rats and a vitamin-D potency such that 0.02 Gm. per day for eight days will cure experimental rickets in rats which have been deprived of vitamin D and of ultraviolet light.

Dosage.—For adults, 2 to 4 cc. (30 to 60 minims) three times a day; for children, 1 to 2 cc. (15 to 30 minims) three times a day.

Manufactured by Tailby-Nason Co., Boston. No U. S. patent or trademark.

Nason's palatable cod-liver oil complies with the U. S. P. standards for cod-liver oil. In addition, it is required to have a content of fat soluble vitamin A, determined by the U. S. P. method, of not less than 500 units per Gm., and an antirachitic potency such that 0.02 Gm. will produce definite healing in the leg bones of rachitic rats in eight days when added to a diet lacking in vitamin D, the rats being also deprived of ultraviolet light.

TYPHOID VACCINE (See New and Nonofficial Remedies, 1927, p. 365).

The Gilliland Laboratories, Inc., Marietta, Pa.

Typhoid Vaccine (See New and Nonofficial Remedies, 1927, p. 367): Also marketed in packages of thirty ampules (ten complete immunizations), ten containing 500 million, and twenty containing 1000 million killed typhoid bacilli each.

From *Jour. A. M. A.*, Nov. 19, 1927.

EPHEDRINE.— Ephedrina.— Ephedrine base.—α hydroxy-β- methyl - amino - propyl-benzene ($C_6H_5.CHOH.CH[NHCH_3).CH_3$). An alkaloid derived from *Ephedra equisetina.*

Actions and Uses.—The same as those of the ephedrine salts. The free alkaloid is employed in mediums, such as oils, in which it is more soluble than the salts.

Dosage.—One per cent, in oil, may be used for local application to mucous membranes.

Ephedrine occurs as an unctuous, almost colorless solid that tends to crystallize as needles. The needles melt at 34–40 C., and the liquefied alkaloid boils above 200 C. The specific rotation in absolute alcohol (Note: must be no moisture by anhydrous copper sulphate test) $[\alpha]\frac{D}{20}$ falls between —6 and —7.5. It is soluble in alcohol, chloroform, ether and water, the solutions being strongly alkaline to litmus paper moistened with water. Dissolve 0.0005 Gm. of ephedrine in 1 cc. of water and add 0.1 cc. of copper sulphate solution (10 per cent) followed by 1 cc. of sodium hydroxide solution (20 per cent); a reddish purple color develops. To this solution add 1 cc. of ether, shake the mixture and compare with a tube made up similarly, but without using ether: the reddish purple is partially extracted (apparently decolorized by the ether). Dissolve 0.05 Gm. of ephedrine in 10 cc. of chloroform and allow to stand twelve hours, evaporate spontaneously: white crystals of ephedrine hydrochloride appear; wash with a little chloroform, dry: the crystals melt between 214 and 220 C.

Dissolve 0.05 Gm. of ephedrine in 30 to 40 cc. of distilled water, add 1 cc. of diluted nitric acid and 1 cc. of silver nitrate solution: less turbidity results than in a control tube using 0.1 cc. of fiftieth-normal hydrochloric acid (*limit of chloride*). Dissolve 0.05 Gm. of ephedrine in from 30 to 40 cc. of distilled water, add 1 cc. of diluted hydrochloric acid and 1 cc. of barium chloride solution: no turbidity develops in ten minutes (*limit of sulphate*).

Dissolve about 0.2 Gm. of ephedrine, accurately weighed, in 10 cc. of ether in a previously tared beaker, add an excess of hydrogen chloride in ether, evaporate to dryness, dry to constant weight over calcium chloride, and weigh; dissolve the residue in distilled water and dilute with distilled water to 10 cc.; observe the angular rotation at 20 C.: the specific rotation in water $[\alpha]\frac{D}{20}$ falls between —33 and —35.5.

Dissolve about 0.2 Gm., accurately weighed, in 10 cc. of neutralized alcohol, add 5 drops of bromcresol green solution and an excess of tenth-normal hydrochloric acid, titrate the excess, using fiftieth-normal sodium hydroxide solution: the acid used in neutralizing the ephedrine is equivalent to not less than 97 per cent, nor more than 100 per cent of the ephedrine used.

Place about 0.3 Gm. of ephedrine accurately weighed in a previously tared wide-mouthed weighing bottle in a desiccator and allow to stand over calcium chloride at room temperature for eighteen hours (the temperature should not go above 22 C.): it loses not more than 1.8 per cent of its weight.

Heat about 0.1 Gm. of ephedrine accurately weighed in a platinum dish until constant weight is obtained. The ash is less than 0.1 per cent.

Ephedrine-Lilly.—A brand of ephedrine-N. N. R.

Manufactured by Eli Lilly & Company, Indianapolis. No U. S. patent or trademark.

Inhalant Ephedrine Compound-Lilly: A solution containing ephedrine-Lilly, 1 per cent (by weight) in a liquid composed of menthol, 0.66 Gm.; camphor, 0.66 Gm.; oil of thyme, 0.31 cc.; liquid petrolatum to make 100 cc. U. S. patent applied for. No U. S. trademark.

PERSONAL AND NEWS ITEMS.

William A. Oren, President of the N. A. R. D., was tendered an elaborate testimonial luncheon, under the auspices of Eli Lilly and Company, Kiefer-Stewart Company, and the Mooney-Mueller-Ward Company, Indianapolis, Indiana, last month. The luncheon was held at the Indianapolis Athletic Club headquarters. J. K. Lilly officiated as toastmaster, welcoming the guests and introducing the various speakers with appropriate remarks. He emphasized the fact that only one other Hoosier had been honored as Mr. Oren had been by being chosen President of the N. A. R. D.

The speakers, all of whom eulogized Mr. Oren for his practical wisdom and devotion to the cause of pharmacy, included the following: Frank T. Stone, Washington, D. C.; Samuel C. Henry and Julius Riemenschneider, Chicago; Russell Rothrock, President of the Indiana State Board of Pharmacy; Wood Wiles, President of the Indiana Pharmaceutical Association; George Schaub, President of the Indianapolis Retail Druggists' Association; Charles Ehlers, Cincinnati; Barret Moxley, Indianapolis and F. W. Meissner, LaPorte, Indiana. Mr. Oren in well selected words expressed his appreciation of the testimonial luncheon and of the many expressions of loyalty and confidence extended to him. He stated that he had worked all of his life for the best interests of pharmacy, but that all of the time he had worked other druggists were working with him, and all that he had accomplished had been through the assistance of others. He also stated that any success he hoped to have in the future would be with the help and coöperation of others interested in pharmacy.

Samuel Wilson Parr, professor emeritus of industrial chemistry, University of Illinois, and internationally known for his researches in coal chemistry, has been elected President of the American Chemical Society for 1928. Professor Parr succeeds Dr. George D. Rosengarten of Philadelphia. He has been a professor in the University of Illinois since 1891.

Dr. Wilmer Krusen, former director of the Department of Health in the Philadelphia City Government and recently elected President of the Philadelphia College of Pharmacy and Science, relinquished his official duties as Director of Health on Monday, January 2nd, when the new Mayor of the city of Philadelphia was inaugurated. In assuming direct administrative control of the College, Dr. Krusen was given a reception in the President's Room of the new College building just completed at 43rd and Kingsessing Avenue in West Philadelphia. Among those who took part in the reception were the Trustees and the major faculty of the College.

Dr. Francis E. Stewart, of Philadelphia, and Mrs. Susan Palmer Linnell, of Engelwood, N. J., were married in New York City, December 26, 1927.

Matthias Noll was in the drug business in Atchison, Kans., for more than forty years. The *Atchison Daily Globe* devotes a column of a recent issue to a sketch of the veteran with historical data of the period during which he served his patrons. Mr. Noll is collecting valuable historical matter relating to the drug business in the State from earliest period to the present and will present this to the Section on Historical Pharmacy of the AMERICAN PHARMACEUTICAL ASSOCIATION. Such efforts are much appreciated and will serve a good purpose; he has set an example for others.

Sharp & Dohme, Inc., Baltimore, has appealed the decision of the British court, dismissing with costs an action brought by the firm against the Boots Pure Drug Company for alleged infringement of their patent for "improvements relating to the manufacture of alkyl resorcinols."

The Abbott Laboratories, North Chicago, Ill., has purchased John T. Milliken & Co., St. Louis.

The Milliken company was established in 1894 by John T. Milliken, to manufacture pharmaceutical products. Dr. Alfred S. Burdick, President of the Abbott Laboratories, states that the Milliken business will be continued at St. Louis for the present with no changes in personnel, and operated as a branch of the Abbott Laboratories.

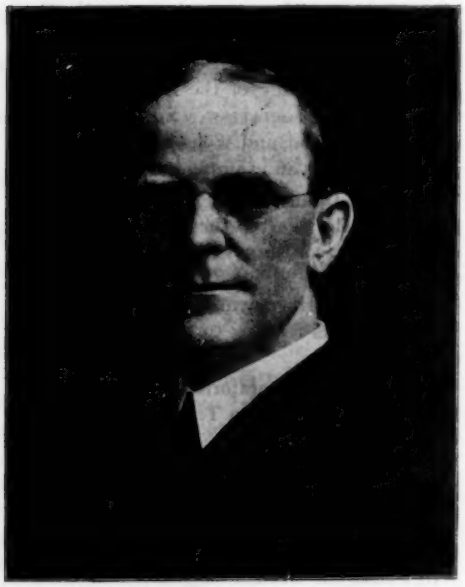
"MILK OF MAGNESIA" HELD REGISTRABLE AS TRADE-MARK.

Right of the Charles H. Phillips Chemical Company to the registration of the words, "Milk of Magnesia," and "Leche de Magnesia," as trade-marks has been upheld by the Court of Appeals of the District of Columbia in a decision given December 5th. This case before the court was an appeal by McKesson & Robbins, Inc., New York, from a decision of the Commissioner of Patents, which had upheld the right at issue.

OBITUARY.

JOHN CRAWFORD WALLACE.

John C. Wallace, of New Castle, Pa.—member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1905—died December 30th, at his home on Wallace Ave., New Castle, Pa. The deceased had been in poor health for several years, but death came suddenly. Mr. Wallace was a life-long resident of New Castle, having been born there July 7, 1859, the son of Dr. James J. and Agnes Davies Wallace, and for many years conducted a leading pharmacy of his home town. The news of his passing came as a shock to his many friends in pharmaceutical circles.



JOHN C. WALLACE.

Mr. Wallace was a former member of the board of trustees of the University of Pittsburgh and also Chairman of the Board of Directors of its School of Pharmacy. The University conferred the honorary degree of Doctor of Pharmacy on him. For many years he was active in State and National pharmaceutical organizations—having served as President of the Pennsylvania Pharmaceutical Association, Chairman of the Legislative Committee of the AMERICAN PHARMACEUTICAL ASSOCIATION. He was the first Chairman of the National Drug Trade Conference and continued in the office for a number of years. The deceased was Past-Presiding Officer of the local Masonic bodies, from Blue Lodge up to the Commandery and District Deputy of the Chapter; he was also a 32nd Degree Scottish Rite Mason and a director of the Masonic Association of New Castle.

Mr. Wallace is survived by his wife—Mrs. Emma Kemp Wallace, who is a member of the A. PH. A.—and four children: John C., Jr., of Stockton, Calif., James J., of Sibley, Ia., Maragaret M. and Dr. William D. Wallace, of New Castle; Dr. Robert A. Wallace, of New Castle, is a brother.

CHARLES H. HITCHCOCK.

Charles H. Hitchcock, pharmacist of Boston and Brookline, Mass., died at Southport, Me., October 14th. The deceased was born in Yarmouth, Me., the son of Gad and Mary Hitchcock. The ancestry, in this country, of the family dates back to Colonial times.

Mr. Hitchcock entered the drug business in 1889, at Hallowell, Me., but moved to Boston during the same year, locating on Tremont St., later, on Huntington Ave. In 1907 he established a store in Brookline, Beacon and St. Mary's Sts., in which he was interested at the time of his demise. He joined the AMERICAN PHARMACEUTICAL ASSOCIATION in 1910.

Mr. Hitchcock is survived by his widow, a sister and two brothers.

GEORGE E. SCHWEINFURTH.

Through the kindness of fellow-members, Robert S. Lehman and William C. Anderson, we are enabled to give a few data relating to the late George E. Schweinfurth, who died at his home in Brooklyn on March 7, 1927.

The deceased was born in New York in 1867; he graduated from New York College of Pharmacy in 1888 and engaged in business on his own account several years later, at the corner of 6th Ave. and 49th St. He retired in 1917 and after that time lived at 3712 Ave. I, Brooklyn. During his business career he took an active part in pharmaceutical affairs, college and other organizations. The deceased was a member of the New York German Apothecaries' Society; he became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1907.

DEATH OF MRS. GEORGE JUDISCH.

We have had the sad news, January 7th, notifying us of the death of Mrs. George

Judisch, wife of our esteemed member and one of the candidates for the presidency of the ASSOCIATION. All members will recall with pleasant recollection the hospitality of Mr. Judisch while on a visit to the institution with which the latter was connected for a quarter of a century. The ladies of the convention will also remember the attention given them by Mrs. Judisch; both the latter and Mr. Judisch were untiring in their efforts for the members during the Des Moines meeting. The heartfelt sympathy of the membership is expressed to the bereaved and the hope that he will have the strength required for this trying period and be comforted by the evidences of friendship and fellowship.

The death of **Julius Koehler,** which occurred suddenly Wednesday morning, November 9th, at this home, 1274 Bergen Street, Brooklyn, N. Y., came as a distinct shock to the entire Essential Oil Trade with which he has been identified for many years. Few men have been so widely known in the industry as Mr. Koehler, who has been connected with the firm of Fritzsche Brothers, Inc., since August 26, 1887. In May 1919 he was made Secretary, in which capacity he served until June 30, 1925, retiring on that date from active participation in the affairs of the firm in order that he might devote more attention to his private interests.

He was born May 8, 1866 and consequently 61 years old at the time of his demise. He is survived by his wife and two daughters, Mrs. A. Zoellner, Beverly Hills, California and Mrs. Saxton, of Brooklyn, N. Y.

S. W. Wooley, former editor of the *Chemist and Druggist*, London, died November 25th, aged sixty-two years. The deceased had recently retired from the editorship of the well-and favorably-known British pharmaceutical publication, and had hoped to spend many more years in his country home. A friend, in commenting on his death, refers to a letter received from the deceased in which he made reference to symptoms of disease concerning which he had been advised to obtain the advice of a specialist, and soon thereafter came the news of his demise. "So passes a pharmacist of the highest type," states the writer, "and a journalist of far-seeing acuteness of vision. My list of close friends shows a permanent gap, but I grieve most that he should have been called upon to depart suddenly, without being allowed the respite of those few years of eagerly anticipated retirement before the coming of life's eclipse."

Allen B. Wrisley, pioneer Chicago soap manufacturer, died December 19th at Johns Hopkins Hospital, Baltimore, aged ninety-one years. Until very recently Mr. Wrisley spent some time each day at the office of the establishment of which he was one of the founders.

SOCIETIES AND COLLEGES.

GERMAN PHARMACISTS TO VISIT IN THE UNITED STATES.

Dr. H. Salzmann, President of the German Apothecaries' Society, has written Editor Hugo Kantrowitz of the *New York Apotheker Zeitung* that he, with quite a number of members of the Society, expects to visit in the United States from May 17th to June 30th. Efforts are being made to have the visitors put off their visit for a few weeks or extend it so as to attend the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION.

NEW YORK DRUG CONFERENCE OFFICERS.

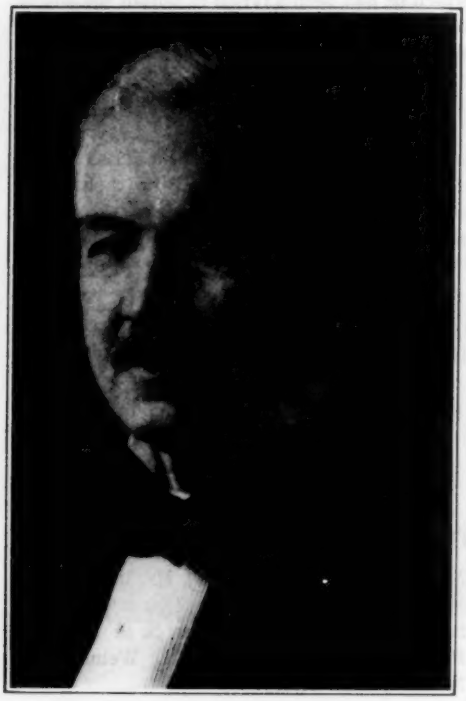
The New York Pharmaceutical Conference, December 27th, elected officers as follows: *President*, S. Kopald; *First Vice-President*, C. Bjorwall; *Second Vice-President*, H. H. Miller; *Third Vice-President*, H. Goldschmidt; *Secretary*, A. A. Fisher; *Treasurer*, Mayer Sambur; *Executive Committee*, S. S. Dworkin, P. Diamond, S. B. Groisser, L. Weinstein, J. Munafo, S. H. Seeley.

THE VETERAN DRUGGISTS' ASSOCIATION OF CINCINNATI FORMED.

On Tuesday, December 27th, the Veteran Druggists' Association of Cincinnati was organized at a luncheon in the Hotel Gibson. The organization is the direct result of continued effort on the part of Wilhelm Bodemann, who has been urging it for a number of years, and the Cincinnati Society recognizes Mr. Bodemann as its sponsor together with the Chicago Veteran Druggists' Association.

The organization was formed by Professor John Uri Lloyd, Messrs. Alfred Deland, Chas.

Ehlers, Julius Greyer, C. G. Merrell, E. H. Thiesing, Carl Cramer, Otto E. Kistner, Nicholas Blank, Fred Fruechtemeyer, Otto Kohl, H. G. Schmuelling, C. G. Foertmeyer, Jos. Schneider, Edw. Voss, Jr., Fred A. Nadler, Henry J. Dusterberg, G. A. Prinzbach, H. W. Walterman, Louis Lutterman, Louis Roettig, D. Edw. Murphy and Frank H. Freericks. It was decided that its charter enrollment shall be either twenty-five or not to exceed thirty, as is to be finally determined at the next monthly luncheon. Letters and telegrams of congratulation from Wilhelm Bodemann, Dean Wulling, H. C. Kruckeberg, Nathaniel Nicolai and Robert S. Lehman were read with due appreciation. The following officers were unanimously chosen:



THOMAS NEVIN JAMIESON.

Founder of Chicago Veteran Druggists' Association, the *père* of them all.

Honorary President, Prof. John Uri Lloyd.
Honorary Vice-President, Alfred DeLang.
President, Chas. Ehlers.
Vice-President, Julius Greyer.
Treasurer, Otto E. Kistner.
Recording Secretary, E. H. Thiesing.
Corresponding Secretary, Frank H. Freericks.

The meetings of the Veteran Association of Cincinnati will be held on the fourth Tuesday of every month.

OREGON DRUG TRADE CONFERENCE.

Operating Costs in Oregon Drug Stores will be the topic for discussion in the drug trade conference to be held in the Pharmacy building at Corvallis February 14th, in connection with the twenty-fourth annual convention of the Oregon Retail Merchants' Association. It is not necessary that druggists be members of the Oregon Retail Merchants' Association to be eligible to attend the drug trade conference. There are no fees or dues and for the welfare of the drug business in Oregon the committee in charge desires a large attendance and a frank discussion of business costs. Since only one day—February 14th—will be devoted to the conference, druggists residing within 100 miles from Corvallis can leave their homes immediately after breakfast and as the conference will close about 3:30 P.M. they can be at home for dinner.

For the purpose of outlining a practical questionnaire a committee has made a thorough study of business costs as published in the trade bulletins of the United States Chamber of Commerce, the Harvard Bureau of Business Research, the Druggists' Research Bureau and others. All reports must be anonymous.

The personnel of the committee is as follows: J. F. Allen, Corvallis, *Chairman;* S. R. Stevenson, Eugene; S. A. Matthieu, Portland; E. E. Magee, Klamath Falls; F. S. Ward, Portland; L. B. Ferguson, Newberg; J. R. Leach, Portland and Dean A. Ziefle, Corvallis, Secretary.

MASONS GIVE $1,000,000 TO GEORGE WASHINGTON UNIVERSITY.

A gift of $1,000,000 from the Supreme Council, Scottish Rite Masons of the southern jurisdiction to George Washington University has been announced by the University Trustees.

The gift is the largest ever made to the institution. The disposition of the money will be in the hands of the trustees for use beginning in the fall semester 1928. The Masons made the gift for the establishment of a school of Government at the University.

Mrs. John F. Hancock and **Mrs. Charles E. Dohme,** widows of former presidents of AMERICAN PHARMACEUTICAL ASSOCIATION, celebrated their eighty-seventh birthdays this month. Each member of the Baltimore Veteran Druggists' Association at the January meeting gave his carnation to the birthday celebrants.

THE PHARMACIST AND THE LAW.

CAUSTIC POISON RULES.

Regulations for administration of the Federal caustic poisons act by the Food, Drug and Insecticide Administration, have been issued by the United States Department of Agriculture. Druggists should secure copies of these regulations as the law is now in force. The *Oil, Paint and Drug Reporter* in commenting on the regulations states that "the Federal Caustic Poisons Law has not been brought into close relationship with its apparent purpose by the regulations which have been issued as guides in its administration. If anything, the scope of the measure has been extended by the rules still further from the commendable idea of identifying certain everyday materials as poisonous * * * * *

"For the sake of caution alone, in a preventive sense, so to speak, it would be enough, most folks would assume, to have a 'poison' label on fancifully named products containing any of the officially designated poisons. But, there is the necessity of treating poisonings when they do occur through misuse of any such preparation. Such treatment necessitates knowledge of the poison involved. In this direction lies also the matter of antidotes. The law requires that they be stated on the label, and the administrative officials are working now on a basic list. The regulations require that the designated antidotal agents shall be, in so far as practicable, such as are usually available in the household.

"So it goes for the most part in the regulations. They tighten up the requirements of the act. There is but one easing paragraph among them. The label on a parcel embraced by the law does not, as the act implies, have to be a manufacturer's label.

"These regulations raise the moot question of how a guaranty may be given. They say that it shall not appear on the label or package. The law has not yet been found, in connection with a similar requirement as to 'pure drugs' labels, that compels a manufacturer to refrain from telling the truth on a label, even in the matter of his willingness to stand behind his wares."

HANDBOOK FOR PROHIBITION CORPS.

Rules and regulations for the guidance of prohibition enforcement executives and agents have been assembled in one handbook and the entire enforcement corps will be held strictly accountable under them, it is stated. Instead of a vast number of separate lists of instructions, the prohibition service now has one document to which it may turn in the solution of troublesome questions and for the interpretation of the laws.

Commissioner J. M. Doran in commenting on the issuance of this book said, "We have had too much hit-and-miss business. This handbook or manual should assist agents because they can now know our entire policy without having to cart around an armful of loose instruction sheets, some of which may be easily lost. Only minor changes are made in it from instructions previously issued, and these are intended to clarify the rules under which our men work."

PROHIBITION DISTRICTS ARE TO BE REALIGNED.

The Treasury Department has made the following changes in prohibition district lines, effective February 1st:

The Northern Judicial District of Florida to be detached from District No. 9 and placed with District No. 10 with headquarters at New Orleans.

Indiana to be removed from District No. 13 and placed with District No. 8, with headquarters at Columbus, Ohio.

Iowa to be taken from District No. 15 and placed with District No. 13, with headquarters at Chicago.

Kansas and Oklahoma to be taken from Districts Nos. 16 and 17, respectively, and placed with Nebraska, forming District No. 15 with headquarters at Topeka, Kansas.

South Dakota to be taken from District No. 15 and placed with District No. 14, with headquarters at St. Paul.

Arkansas to be taken from District No. 10 and placed with District No. 16, with headquarters at St. Louis.

SEEK REËXAMINATION OF PROHIBITION AGENTS.

Approximately 85 per cent of all prohibition agents who were examined under Civil Service requirements for reappointment in the prohibition service recently have failed to pass the test unless the Civil Service Commission grants a new examination, the prohibition force will lose many of its best men, the Commissioner of Prohibition, Dr. J. M. Doran, announced.

Dr. Doran said the Bureau of Prohibition, through the Department of the Treasury, had requested the Commission to grant new examinations for the agents, adding that the first one contained many questions which are "far over the heads of the agent."

BOOK NOTICES AND REVIEWS.

Drugs-Map of the World. By Dr. Wolfgang Himmelbaur and Dr. Bernhard Hollinger. Brochure, 48 pp., with seven maps. Kartographische Anstalt G. Freytag & Berndt in Vienna. M 21.50.

This the latest contribution to pharmacogeography will be welcomed by all students and teachers of our vegetable materia pharmaceutica. To the former it will visualize much of his book knowledge. To the latter it will be a welcome pedagogical tool.

Whereas certain parts of this chapter of pharmacognosy have been worked up thoroughly, others require further exploration. This becomes apparent from a mere glance at the drug map of North America. Most, if not almost all of our medicinal plants would seem to grow east of the Mississippi. True, Cascara Sagrada is indicated in the extreme west but near the Mexican border and not near the Canadian border or in Canada.

Even though the English of the text calls for revision of the idiom, the brochure with its maps should find a place in every college or school of pharmacy. E. K.

Pharmacognosy and Materia Medica. For Students in Pharmacy and Practicing Pharmacists. By Homer C. Washburn, Ph.C., B.S. (in Phar.) and Walter H. Blome, Ph.C., M.S. With a chapter on Vitamines and one on Insulin by Walter Pitz, M.S. 585 pp, 110 illustrations. John Wiley & Sons, Inc., New York, 1927. Price $5.00.

The aim of the authors, is to present the important features and facts concerning plant and animal drugs. They therefore give for each drug: its Latin name, the derivation of this name and how it is pronounced; its English name; its synonyms; botanic source; family; part used; description and physical properties; habitat; a discussion, in which a more detailed description is given of the plant, or animal source, an account of how the drug is obtained, varieties, etc., etc.; constituents; properties, use and dose; and finally official preparations. All of the vegetable and animal drugs listed in the U. S. P. X, and the N. F. V as well as a number of the more important non-official drugs which find frequent use in present-day practice are thus taken up; the letters U. S. P. designating those of the Pharmacopœia, and N. F. those of the National Formulary.

Microscopic characteristics of drugs are not given, the authors being convinced that this work is less essential, and at best should be given in the course in microscopical botany. The book thus conceived, makes a most favorable showing, and criticisms are few. First, the authors will do well to follow the U. S. P., and N. F. in printing the source and family as there given, italicizing generic and specific names and the family, and not in italicizing authorities. This, too, is the general custom. To see the name and authority both printed in the same kind of type is confusing. A little more attention should be given to the biological assays. They should not only be mentioned when a drug is thus assayed, but should be described. The authors are rather derelict in this respect, mentioning the fact that drug is assayed biologically only in the case of Digitalis and Oleum Morrhuæ. And finally it would seem best to state whose scheme of classification is being followed in the study of the drugs, or why the particular scheme used is followed since most authors now follow Engler-Gilg in their "Syllabus der Pflanzenfamilien." Two appendices are added which are quite worth while and further enhance the value of the work. Appendix I, a Glossary of Medical Terms, and Appendix II, a Glossary of Botanical and Zoölogical Terms.

Charles C. Plitt.

The Elements of Vegetable Histology. By C. W. Ballard. 2nd Edition. 289 pages, 93 illustrations. John Wiley & Sons, Inc. New York, 1926. Price $3.25.

This is a rather unusual book, unusual in the number of its defects. It is poorly conceived, and contains quite a number of conflicting or otherwise questionable statements, and some also that are certainly incorrect.

The book, first of all, is poorly conceived; no beginner would start with Chapter I, as there outlined and apply the methods outlined for infiltration, fixation and embedding of the material to be studied. All of this is

practically unnecessary in studying most of our drugs. Why not start with sectioning free hand some soaked drug, or better yet, study some bit of epidermis? Chapters I to V, Preparation of Specimens, Mounting of Specimens, The Microscope, The Chemical Reactions of Plant Tissues, and Staining can well be relegated to the Appendix, and there immediately precede Formulas, already finding a place there. Further, Chapter XIX, Microscope Accessories, can also find a place in the Appendix, immediately following the chapter, The Microscope. The reviewer believes that Chapter VI, Plant Cells and Tissues, would be the logical starting point.

As to the second part of my criticism. Botany is still unfortunately burdened with a voluminous synonymy, but every effort is being made to reduce it. Thus such terms as endosperm, periderm, vascular bundle, bark, etc., are coming to have definite meanings. It would seem then, that in a textbook, especially one for the beginner, the author should be alertly on his guard in choosing the terms he uses and in the way he uses them. He should also be careful how he explains various phenomema that arise. The author has paid little attention to these facts. Thus on pages 242, 246 and 248, he speaks of endosperm as also being stored *within* the enbryo itself, when he should well know that endosperm is a storage tissue formed by the endosperm nucleus, and is always stored *outside* of the embryo, although within the embryo sac. His definitions of periderm are conflicting; on page 95, he states that the phellogen forms periderm or bork on its outer side, on page 118, he states that the periderm consists of cork, together with parenchyma, fibrous elements and in some instances stone cells, neither of which statements is correct, periderm being all the tissues formed by the activity of the phellogen on the outside of it, phelloderm on the inside, and the cork cambium or phellogen itself. His second definition, above, is that of bork. On page 95, he calls the phellogen, the true bark, although on page 195, he states correctly that the bark includes all structures external to the cambium. His idea of the primary fibro-vascular bundle in roots, see pages 95, 97, 148, seems to be composite. For beginners, at any rate, it would seem best to hold on to the idea that this stele is of 2 or more separate radial strands of xylem and phloem and that these strands are commonly said to constitute a radial bundle, or better, since the xylem strands are often not independent, to call this condition in the primary xylem and phloem, radial arrangement. (See Introduction to Plant Anatomy, Eames & MacDaniels, page 97.) In describing secondary thickening of the primary fibro-vascular bundle of the root in certain orders of plants on page 95, after stating that a cambium develops, he continues "The cambium occurs on the outer face of each xylem bundle and on the inner face of each phloem bundle," which, of course, is not quite true. The cambium forms only on the inner face of each primary phloem strand, and these arcs of cambium meet in the pericycle, thus completing the ring. His idea, that the strips of tissue between the xylem strands and the phloem strands, page 94, form the primary medullary rays, is also erroneous. These primary medullary rays, he will note, if he examines his figure 35, on page 99, reprinted from "Text-book of General Botany," by R. M. Holman and W. W. Robbins, are generally laid down by the cambium, finally flanking the primary xylem strands. As to the pericycle, the author at no place describes it. In his diagram on page 90, figure 29, showing the primary tissues as found in the root, there is no pericycle shown, and the phloen strands extend to the endodermis. The same mistake is found on page 151, figure 54-B, where xylem and phloem extend to the endodermis. On page 148, he states that radial fibro-vascular bundles are found in all young roots and may even be present in mature monocotyledonous roots. On page 150, he states that concentric fibro-vascular bundles occur only in monocotyledonous roots and stems. On page 179, he again states that concentric and closed collateral types of fibro-vascular bundles are present in the primary roots of monocotyledons. Neither concentric nor closed collateral fibro-vascular bundle is ever found in the primary root of monocotyledons. It is the so-called radial fibro-vascular bundle that is characteristic of primary roots.

There are, too, quite a number of "slips," the author evidently not meaning what he there states. For example, on page 80, he states that saffranin colors lignified walls blue; and on page 10, where he cautions about the position of the knife in cutting embedded material, stating that for paraffin embedded material, it should be held at an angle, and for celloidin embedded material, it should be placed straight, when the opposite is correct. On page 125, he calls wood and bast fibres con-

ducting tissues, instead of supporting tissue; and on the same page, he states that wood fibres are thicker-walled than bast fibres, whereas the opposite is most often true. Again on page 133, where he describes "parasitic plants as those which gain their nutrients by burrowing into the tissues of other plants, they are usually lacking in root hairs, but absorption of water may take place in this type of plants through the modified epidermis of the aerial roots which are usually present." On page 27, he calls the converging concavo-convex lens, a convexo-convex lens, which really is another name for the double convex lens; and the diverging concavo-convex lens he calls a concavo-concave lens, which is another name for the double concave lens. There are other such "slips,"but the above will suffice. Rather unwise indeed, it seems to the reviewer, to put a book of this kind in the hands of the unsuspecting beginner in vegetable histology.

CHARLES C. PLITT.

The following four reviews are by Otto Raubenheimer.

A Handbook of Elementary Chemistry for Students of Medicine, Dentistry and Pharmacy. By J. C. ATTIX, M.S., D.D.S., M.D., Pharm. D., 2d Edition, 12 mo. 278 pp. Cloth, $3.00. Lea & Febiger, 600 S. Washington Square, Philadelphia.

The author is Professor of Chemistry and Toxicology in the Medical and Pharmaceutical Departments of Temple University and consequently writes with some authority. This little book is not intended to displace the larger works on chemistry, but is planned for the student as a handy little reference book and as the title states, "A Handbook of Elementary Chemistry."

Part I, on 72 pages, deals with Physics, Chemical Philosophy and Laboratory Methods.

Part II, on 148 pages, comprises the Elements and their Compounds.

Part III, on 44 pages, contains Qualitative Analysis.

The 23 illustrations help to elucidate the text. On p. 106 the author correctly states that the name Bromine is derived from the Greek word "bromos" meaning "stench." On p. 77 he states, incorrectly, that ozone means "stench." This should be corrected as its discoverer C. F. Schoenbein at Basel named this allotropic form of oxygen "Ozone" from the Greek "ozein" meaning "to smell." After all, there is a difference between "smell" and "stench."

Aus dem Reiche der Drogen. Geschichtliche, Kulturgeschichtliche und Botanische Betrachtungen über wichtige Drogen. VON DR. E. GILG UND DR. P. N. SCHÜRHOFF. 272 pp. cloth $3.50. Schwazeck-Verlag. Dresden N. 6, and B. Westermann Co., 13 W. 46th St., New York City.

Never in the course of history has History itself been so generally popular as it is to-day. This also pertains to history of Pharmacy. May I remind the readers of the foundation of the Society for History of Pharmacy and the publication of Prof. LaWall's excellent book, "Four Thousand Years of Pharmacy." Truly two achievements within a short period to be proud of.

The volume before us is from the pen of two professors of botany and pharmacognosy at the University of Berlin. It treats the history, the botany and pharmacognosy of the principal drugs, as for instance: Cinchona, Glycyrrhiza, the Solanaceae, Strophanthus, Nux Vomica, Sambucus, Cannabis, Yohimbe, Guaiac, Sarsaparilla, Rhubarb, Opium and Cantharides. Truly a variety of subjects of interest to pharmacists. The book is profusely illustrated, some of which I beg to point out: Collection of Pepper, p. 91, Corigliano Licorice Factory, p. 138. Preparation of Curare by South American Indians, p. 173. Smoking Haschisch, p. 193. Monardes, p. 216. Schleiden, p. 217. Leuwenhoek, p. 221. Collection of Opium, p. 250, Sertürner, p. 254. Opium Pipes, p. 250.

The volume contains a mint of knowledge. It is a story which will not only stimulate but inspire every pharmacist, a story which gives an accurate account of the evolution of these drugs, a story which gives the pharmacist a better insight and a bigger grasp on his profession. Every pharmacist who is interested in his profession should read this book.

Science: The False Messiah. By C. E. AYRES. 8 vo. 296 pp. Cloth $3.00. The Bobbs-Merrill Co., 18 E. Vermont St., Indianapolis.

Here is a brilliant book by a brilliant young philosopher, who has taught this subject at Brown, Chicago, Amherst and Reed Universities. He has something to say in this book that is better to the scientists and to a civilization that worships science. Like the reformer Luther, he proposes 23 (mark the number) Theses to be mailed to the Laboratory Door, some of which I want to point out:

1. That the truth of science is established

only by belief, after the manner of all folk-lore.

3. That the credit of science rests wholly upon its connection with machine technology, of which it is a part.

5. That there can be such a thing as too much machinery.

12. That we can keep science and belief separate by relegating our religion to the Sabbath Day.

16. That the laws of science are not statutes, they are definitions.

18. That if we examine our lives and our civilization in the light of science, we see only that they are a natural growth.

23. That when science has become supreme any attempt to rectify its formulas will be persecuted as heresy.

To these twenty-three, mostly destructive criticisms, the referee suggests the addition of two additional *constructive* ones, namely:

24. Imbibe all the science or classified knowledge possible.

25. Make use of same, and turn it into dollars and cents.

This book will arouse interest, if not excitement and criticism. However, it is a literary event of first importance. It is a book which cannot be sidestepped.

The Medicine Man. By E. C. DUDLEY, M.D., Ll.D., Ex-President American Gynecological Society, President Emeritus of Northwestern University, Medical School, etc., 8 vo. 369 pp. Cloth, $3.50. J. H. Sears & Co., Inc., 40 W. 57th St., New York City.

The book before us is the autobiography of one of the leading medical men of our day, covering an active practice of fifty years in the East and Middlewest. It is a book giving the human side of a doctor's life. The physician fifty years ago was a family doctor, a kind guardian of the people's welfare, standing next to the minister of the parish.

In Chapter II Dr. Dudley also relates his experiences in a drug store where he worked for $3.00 a week from 7.00 A.M. to 9.00 P.M. Yes, the good old times! For this reason, if not for any other reason, this book should appeal to pharmacists.

PUBLICATIONS RECEIVED.

Medicinal Plants of France, including also those used in perfumery and for flavoring. Published by authority of Ministère du Commerce et de l'Industrie by the Comité Interministériel des plantes medicinales et des plantes a essences. Address 12 Avenue du Maine, Paris (XV^e^). This is the fourth series and are issued on cards about 5 x 7 inches, beautifully illustrated in color, giving also in connection with the name the more common terms. On the back of each card there are quite complete descriptions, definitions and general information relative to culture, collection, medicinal properties and uses of the drug. The price of this series is not given, but for a previous issue a price of 25 cents for 8 leaflets obtained.

Plough Court.—The History of Allen and Hanburys, Ltd., 1715–1927. The book is profusely illustrated, excellent half-tones of the lineage of this well- and favorably known firm, that has, through a number of its members, contributed largely to pharmacy. Daniel Hanbury was elected an honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1868. He is known to science by his many contributions and memorialized by the Hanbury medal. The "Pharmacographia" (Flückiger and Hanbury) is his greatest work. He traveled extensively and his studies of the sources of drugs cleared up many points in pharmaceutical natural history. Our purpose, however, is not to sketch the distinguished pharmacist, but to make mention of this historical contribution, which has great reference value in every pharmaceutical library. Print, paper and binding are good. An editorial comment in the *Pharmaceutical Journal and Pharmacist,* of November 5th, closes with these lines—"The Plough Court Pharmacy is more than a landmark. Like Scheele's apotheke at Köping and Merck's at Darmstadt, it is a sign and symbol of the scientific and professional credentials, character, performance and powers of an ancient and honorable calling."

The price of the volume is 10s. 6d.

Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1926. With comments that have appeared in the JOURNAL. Cloth. Price, $1.00. Pp. 73. Chicago: American Medical Association, 1927.

Those who are interested in the work of the Council on Pharmacy and Chemistry, and this includes all who have to do with the therapeutic use of drugs, look forward each year to the volume which gives the reasons for the Council's rejection of the preparations found unacceptable for inclusion in "New and Non-official Remedies." These reasons are given in

the Annual Reprint of the Reports of Council on Pharmacy and Chemistry; in addition the book gives the reasons for the omission of certain preparations from "New and Nonofficial Remedies" during the year, and contains several special reports of a general nature authorized by the Council for publication.

The volume also contains the following special reports: A report on the status of *bacillus acidophilus* and *bacillus bulgaricus* therapy, on the basis of which the N. N. R. article on Lactic Acid-Producing Organisms has been revised and rewritten; a preliminary report on the status of the new drug, Ephedrine.

New and Nonofficial Remedies now appear in each issue of the JOURNAL A. PH. A.

New and Nonofficial Remedies, 1927, containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1927. Cloth. Price, postpaid, $1.50. Pp. 473, XLVII. Chicago. American Medical Association.

The appearance of the annual edition of "New and Nonofficial Remedies" is looked upon as an event among all those interested in drugs and their therapeutic use. The text is so carefully scrutinized and revised each year by the various members of the Council on Pharmacy and Chemistry that each issue is essentially a new book, a safe guide to the frontier that lies between the official drugs and the latest preparations launched by the pharmaceutical manufacturers.

The mechanism of the book is excellent: each preparation is classified, and each classification is preceded by a general and critical discussion of the group by one who is an authority on the subject; there is an exhaustive index not only to the contents of the book, but also, separately, to the literature concerning the host of preparations that the Council has found unacceptable for inclusion. A glance at the book shows that the most important single revision this year is that of the general article on Lactic Acid-Producing Organisms, which has been radically revised and rewritten to show the present status of therapy in this field. Further perusal shows that many preparations have been omitted. The preface explains that many of these have been omitted because the manufacturers or distributors have not presented evidence to demonstrate their continued eligibility. Some have been omitted because they have become official articles by inclusion in the tenth edition of the U. S. Pharmacopœia; such articles, when marketed under the pharmacopœial name or synonym, and without special claims, do not require description in "New and Nonofficial Remedies."

Among the preparations newly admitted to the book are: Isacen, a product related to phenolphthalein; Ipral, a barbital hypnotic; a cod-liver oil concentrate having a definite vitamin-A and vitamin-B potency; and three erysipelas streptococcus antitoxin preparations.

New and Nonofficial Remedies is indispensable to physicians and pharmacists. It contains information about medical products which cannot be found in any other publication.

The Toxic Constituent of Richweed or White Snakeroot (Eupatorium Urticæfolium).—A reprint from *Journal of Agricultural Research*, September 15, 1927. BY JAMES FILTON COUCH, Pathological Division, Bureau of Animal Industry, U. S. Department of Agriculture. Published by authority of the Secretary of Agriculture with the coöperation of the Association of Land-Grant Colleges and Universities.

Castile Soap.—A monograph covering the origin, history and significance of the term "Castile Soap" together with a discussion of the properties, uses, etc., based upon over 400 extracts from the literature of 400 years. BY R. W. MITCHELL, chemist to Lockwood Brackett Co., Boston.

CHEMICAL RESEARCH WILL BE EXPANDED.

Chief of the Bureau of Chemistry, C. A. Browne, in his annual report to the Secretary of Agriculture, expresses the hope that the research activities of the Bureau will be expanded and undergo a period of enlargement and growth commensurate with the importance of such investigations.

DEATH OF CASWELL A. MAYO.

Just before completion of this number of the JOURNAL we were advised of the death of former President Caswell A. Mayo, on January 13th. Funeral services were held in Cincinnati on the 15th; the ceremonies in Brooklyn were held on the 17th at Fairchild Chapel, 86 Lefferts Place; interment was made at Evergreen Cemetery. Sketch of the deceased will appear in the February number of the JOURNAL.